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AN INDEX TO ADVERTISEMENTS in this number of the Railroad Gazette appears on page vii.

JUST PUBLISHED:
RAILWAY DISBURSEMENTS
And the Accounts into which they are Naturally Divided.

By MARSHALL M. KIRKMAN.

This is a volume of 254 pages, embracing carefully worked instructions in the form of concise rules for the government of the various officials and agents in reporting to the accounting officer, the material disbursed in operations; the labor performed by operatives; and the moneys expended on account of the company, and including copies of all the important blank forms required by employees in making the returns required of them. The rules have the great merit of simplicity, of directness and of comprehensiveness; they are especially important merit of perfect practicality upon a road only a few miles in length, or one extending uninterruptedly across the continent.

The most carefully considered provision is made for writing in the simplest manner possible at the cost of operating any particular section or division of a railway; railway managers will understand how important this is with long lines or with lines possessing branches or divisions which are relatively unproductive; it is also important with lines uniformly productive, in this, that it enables the management to discover the relative economy used upon the different portions of the line. The volume defines with perspicuous clearness the basis of expense that properly belong under the various general headings, thus making all comparative statements absolutely trustworthy and accurate. As there are some lines hundred separate and distinct items of material alone that enter into the ordinary operations of a railway, without mentioning the different classes of labor and expense, it can readily be seen how important it is to a company that its disbursements should be methodically classified.

It contains an easy and natural subdivision of the current expenses of a railway, based on principles readily understood. It defines in the clearest possible manner the difference between expenditures which add nothing to the original value of the property and those which are deemed as improvements or additions, making plain to the least expert the difference between Expense and Capital account. It embraces comprehensive and systematic rules for keeping the time of employees accurately and reliably. It contains simple and efficacious rules by which the material and correct record is secured for the material received at the various storehouses and shops, also the material sold or disbursed in the operations of the road. It contemplates an independent and responsible supervision of the material, coal, wood, ties and other supplies paid for by our railway companies, which, in the aggregate, amount annually to so many millions of dollars.

The book is invaluable to railway officers and accountants as a book of reference. To those railway employees who are not directly identified with the department of storehouses, yet who are wisely anxious to learn all they can in relation to their profession, it affords a clear and complete exposition of the system, that, without its aid, would require very unusual facilities as well as years of practical study in the departments and sub-departments of our railways.

The most complete and exact rules for keeping railroad disbursement accounts ever published. Price \$2, post paid. Published and for sale by the RAILROAD GAZETTE, 73 Broadway, New York.

GEORGE A. EVANS,
Bethlehem Steel Rails,
74 WALL STREET, N. Y.
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INTER-LOCKING SYSTEM.

CAUTION.

Whereas, in the year 1856, Letters Patent were granted in England to John Saxby for his original invention of Locking Apparatus to prevent accidents at junctions; and whereas the said John Saxby, together with John Stinson Farmer, trading under the style or firm of Saxby & Farmer, as Railway Signalling Engineers and Manufacturers, in London, England, are the sole proprietors of the said patent, as well as of several other English patents subsequently granted to them for improvements; and whereas they were the first to introduce the inter-locking system in America, and are now the sole proprietors of three several United States Patents granted to them for such improvements, as well as of a patent granted to John Ingham for further improvements; which patents are of number and date as follows, viz.:

United States Patent No. 80,878 August 11, 1868,
" " 131,788 October 1, 1872,
" " 132,416 " 23, 1872,
" " 169,811 Nov. 9, 1875, and

whereas of late various Signalling Apparatus have been advertised or made, which are infringements of the above or of some or one of the above-mentioned United States Patents,

All persons and companies are hereby cautioned against making, vending, or using any such Signalling Apparatus which are infringements of the above-mentioned patents or some or one of them; and notice is hereby given that they will be held responsible for any such infringements.

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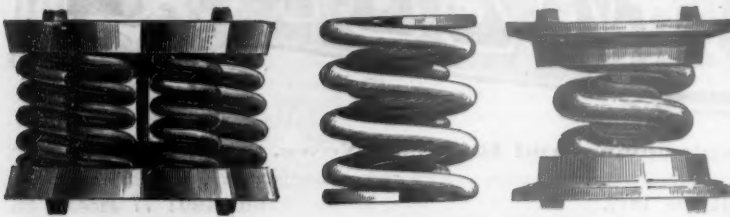
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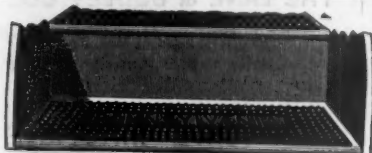
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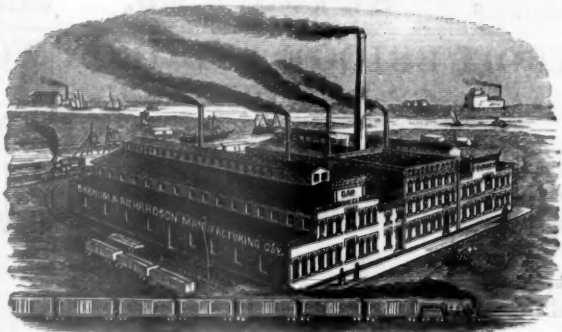
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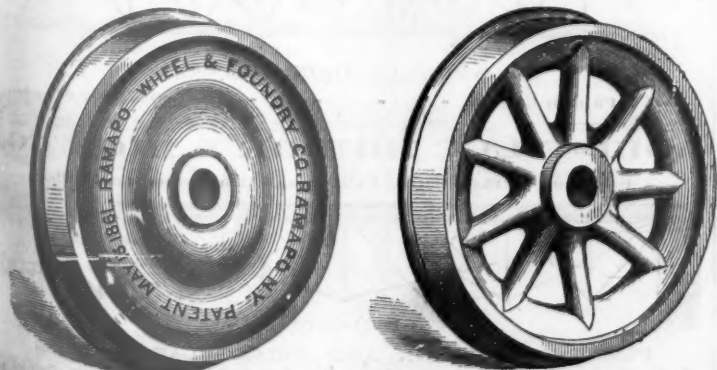
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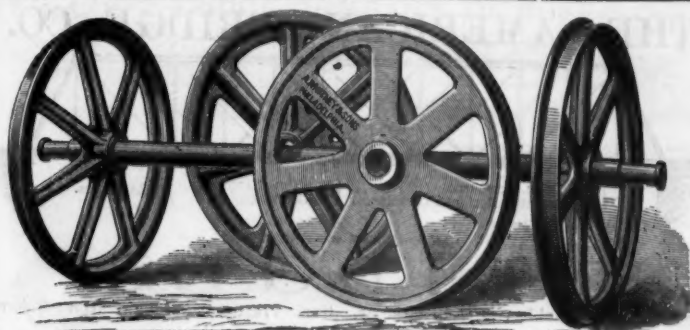
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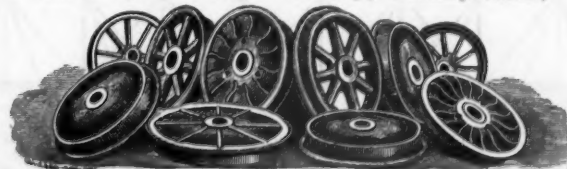
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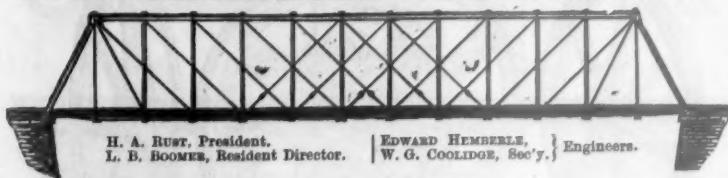


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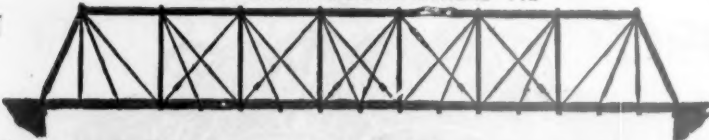
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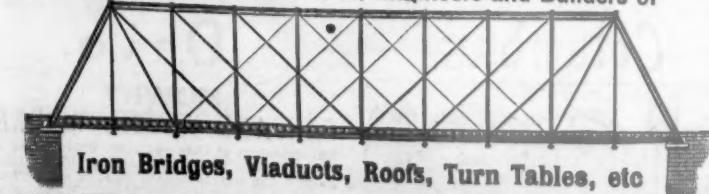
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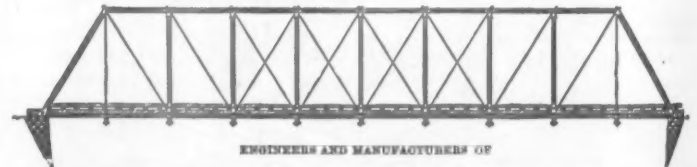
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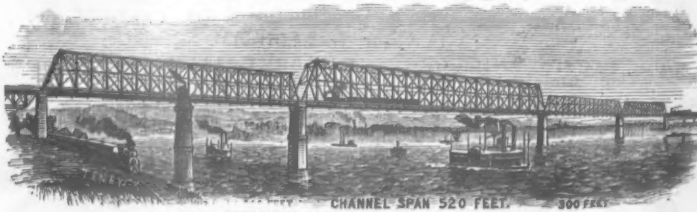
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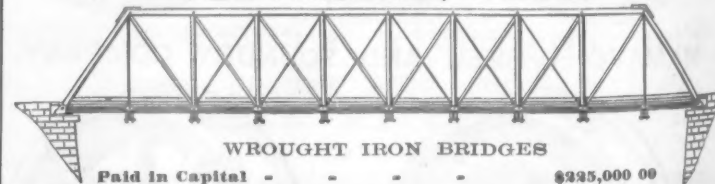
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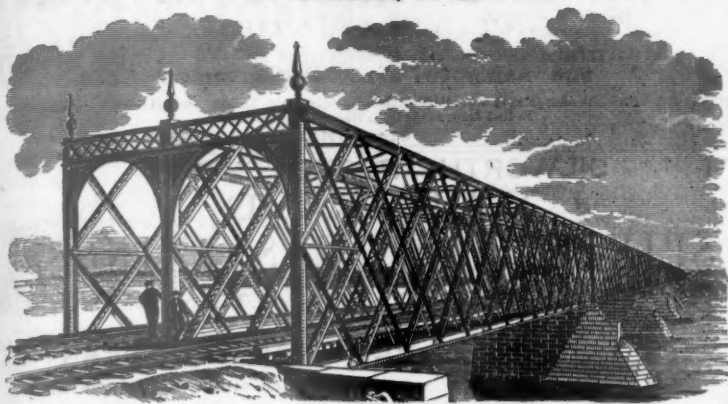
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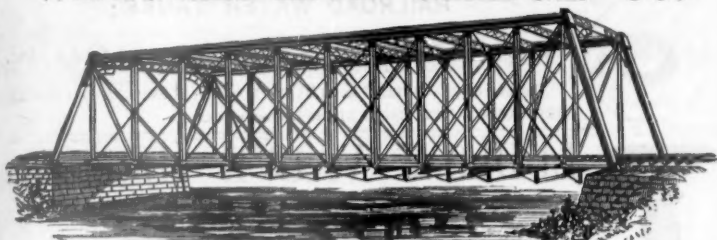
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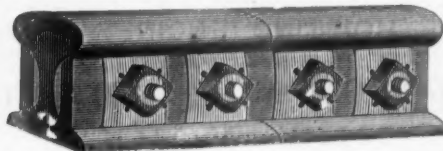
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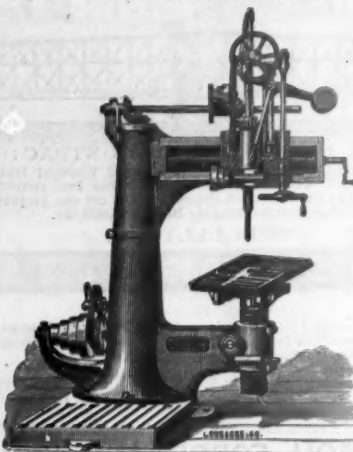
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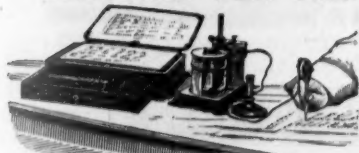
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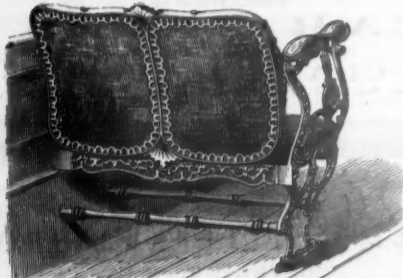
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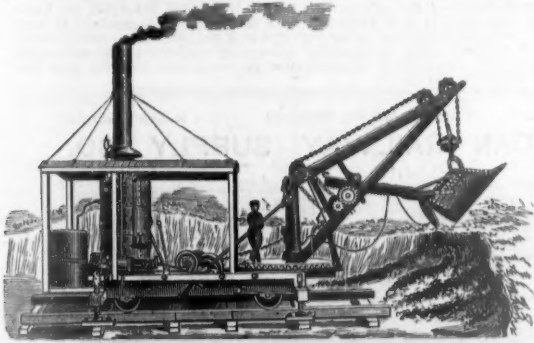
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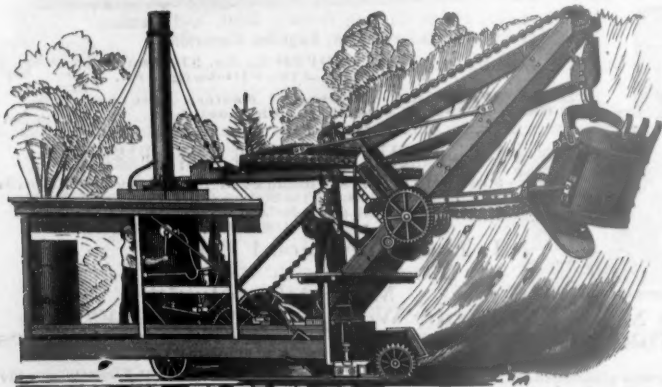
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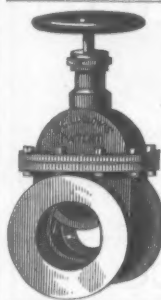
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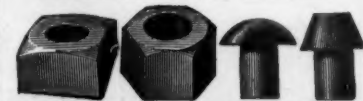


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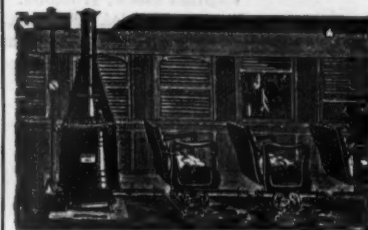
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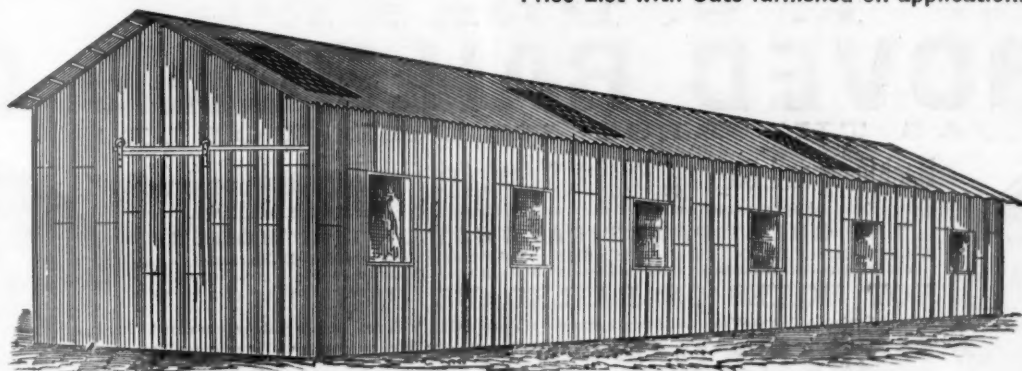
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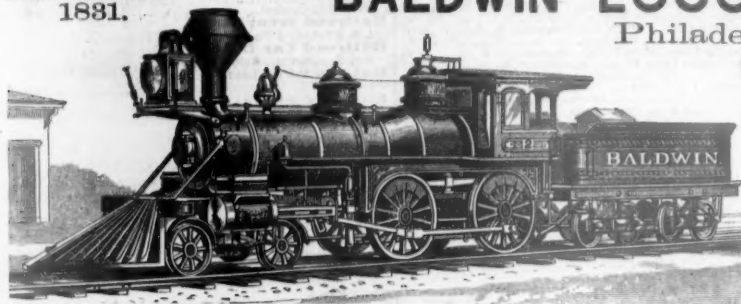
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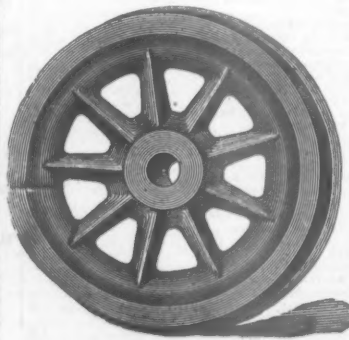
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FRIDAY, APRIL 20, 1877.

Locomotive Indicator Diagrams.

Perhaps few people escape the perpetration of occasional blunders, at the discovery of which the sunshine of life fades away; and probably none are more liable to that sort of eclipse than editors, especially of illustrated technical papers, because an average printer does not know an engraving of a crank-pin from one of a rail section. Last week sudden darkness fell upon the office of the *Railroad Gazette*, when the first copy of that paper was sent in from the printers. Artemus Ward, when he started his career with a show of "wax dummies and a kangaroo," announced it as "a great moral exhibition," but afterwards was obliged to retract the latter, because the "cursed kangaroo made him swear so much that it defeated the original intention." If any of our readers desire to know where our "kangaroo" comes in, let them refer to the engravings which last week were said to represent indicator diagrams, and they will find that they resemble the animal referred to about as much as what they were said to be. We are not prepared to admit that the example of the immortal Artemus was followed to its bitter end, but certainly

of your new engines as developed by the indicator, and I send you tracings of cards sent a few days ago of engine No. 73 (16x24 cylinder, "American" locomotive, 5 ft. driving wheels). What they appear to show is, that the motion and set of your valve are good: very good indeed.

"The lead at full gear is too great (it should be nothing) for a perfect card. It will be noticed that compression fully meets the want which theory makes lead of valve supply; and when both are given (compression being constant to a certain extent), so much is taken from the full engine duty.

"My friend who took these cards is greatly surprised at their 'perfection,' as he calls it, and I must confess something of the same.

"You are at liberty, of course, to use them, if so disposed.

"Respectfully,

(Signed,)

"G. W. CUSHING,

"Superintendent of Machinery."

Contributions.

An Analysis of the Lately Published Experiments of Mr. Kirkaldy on Riveted Joints.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The tabulated results of experiments appearing in your issue of March 23, ult., are at once interesting and unsatisfactory. Interesting by reason of the additional evidence they furnish on the strength of riveted joints, and unsatisfactory in the brevity of statement and lack of explanation. It is unfortunate also that a rupture by shearing and another by tearing should have been averaged together and only the average published.

Looked at theoretically, we should not expect a joint of a single line of rivets to have more than 50 per cent. of the

area in case of shearing, and with area under tension in case of tearing, and we thus obtain what is of greatest importance to know, the percentage of loss of strength in the breaking area. In the case of tearing, these percentages of loss would appear anomalous, did we not have before us the bearing areas in the same joint, or areas exposed to crushing. Thus in the first instance of lap joints, single-riveted, with a net section of 59.4 per cent. the strength was only 38.9 per cent., showing a loss of 20.5 per cent. of strength compared with gross section, or of 34.5 per cent. compared with the net section.

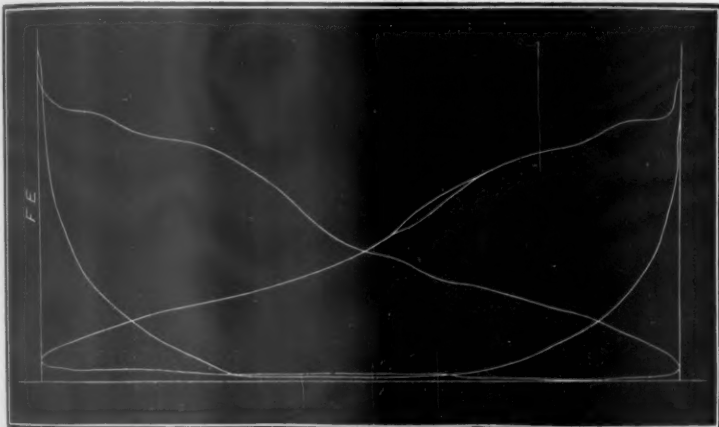
Undoubtedly this joint first yielded by crushing, the bearing area being only 40.6 per cent. of the gross area, and the loss of strength 4.2 per cent. of net bearing area. This clue, however, is far from satisfactory in all cases, and we must either fall back on the friction or consider that the facts of the case are not sufficiently explained.

It may happen that a plate which begins to yield by crushing ultimately fails by tearing, and so the percentage of strength, which is found to be greater than the percentage of bearing area, may be accounted for without considering friction.

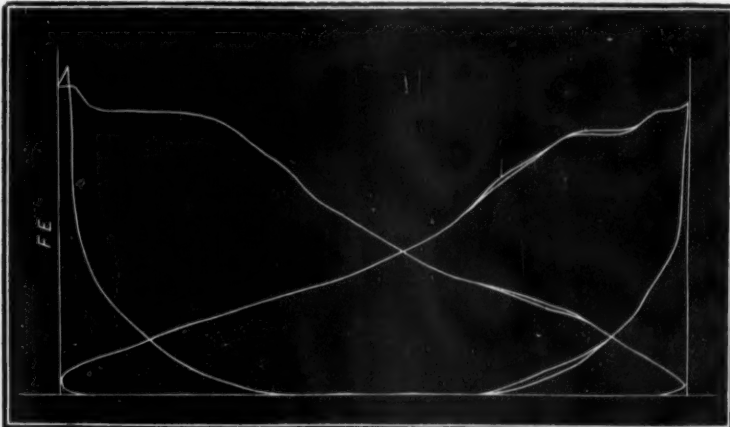
At the same time that crushing is gradually going on, the plate between rivets is being stretched, and the net section reduced until it finally becomes equal to or less than the area exposed to crushing, and the plate is torn. Yet a joint with a less net section of plate might have developed a greater strength by affording a larger bearing area.

EXPLANATION OF THE TABLES.

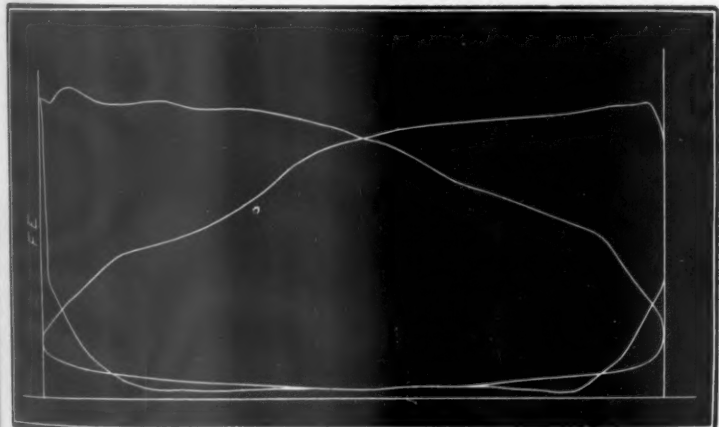
In the accompanying tables the first three and the twelfth



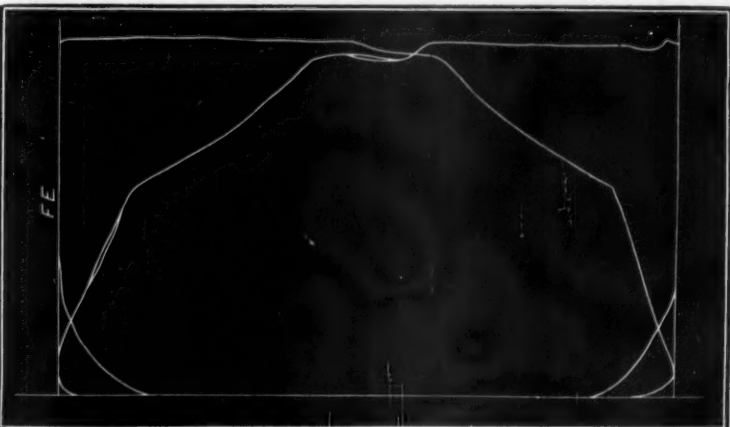
Steam pressure, 110 lbs.; 120 revolutions per minute; steam cut off at 8 1/2 inches. Double exhaust nozzles, 2 1/2 in. diameter. Throttle wide open. Scale of indicator, 60.



Steam pressure, 110 lbs.; 95 revolutions per minute. Steam cut off at 8 1/2 inches. Throttle wide open.



Steam pressure, 110 lbs.; 75 revolutions per minute. Steam cut off at 14 inches. Throttle wide open.



Steam pressure, 120 lbs.; 45 revolutions per minute. Steam cut off at 14 inches. Throttle wide open.

the state of his and the editors' minds were very much the same when they discovered the "general cussedness of things." To be brief, the wrong engravings were sent to the printers, and—wretched men—they obeyed orders and printed them. Whereat Mr. Joshua Rose writes as follows:

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your last issue contains four diagrams of valve movements, which the contributor calls "indicator diagrams." I believe myself to be the originator of this form of diagram, and have thus far published twenty-two of them, and two of 16x24 in. locomotives were published in the *Polytechnic Review* of April 1. As employed by me, the diagram exhibits the effective areas of the ports acting as steam and as exhaust ports, and I am at a loss to perceive how such diagrams can be produced by the instrument known as the indicator. Your contributor failed to explain whether the diagrams Nos. 3 and 4 were from the same engine with the links hooked up, or whether they were taken from another engine having 1 1/2 inch ports: in any event I would call his attention to the fact that the effective port areas of diagrams 1, 2 and 4 is less as an exhaust port than it is as a steam port.

JOSHUA ROSE.

We have no means of knowing when Mr. Rose first used these diagrams, but substantially the same kind were published in the *Railroad Gazette* of Jan. 21, 1876, which were received from another contributor. Those published last week, however, were not only like Mr. Rose's diagrams, but were his—engraved from his diagrams. Below we republish Mr. Cushing's letter with the right engravings—at least we hope they will prove right; but our faith in the integrity of things has been sadly shaken.

"Missouri, Kansas & Texas Railway,"

"SEDALE, MO., Jan. 18, 1877.

"Messrs. Burnham, Parry Williams & Co.,"

"GENTLEMEN: You may feel an interest in the valve motion

strength of the gross plate. For assuming that the resistances of the metal to tearing and crushing are equal, one half the sectional area of the plate must be devoted to each strain, and we cannot increase the area exposed to one strain, except at the expense of the area exposed to the other. If the rivet area is somewhat in excess of the net area of plate section, we shall prevent shearing, but shall not increase the strength of joint thereby, except so far as the friction of surfaces may effect this.

It is probable that when the breaking strength of a single riveted joint has exceeded 50 per cent. of gross plate, the excess has been due to friction.

Similarly, we should not expect the strength of a double-riveted joint to bear a greater ratio to the strength of gross plate than the net section bears to the gross section. Any excess shown by experiment may be credited to friction.

Two lines of rivets giving a double bearing surface will require to occupy only one-third the area of the plate, leaving two-thirds to resist tension. Hence, the strength of joint may not be expected to exceed 66.6 per cent. of the gross strength, when those proportions are observed, unless we count on friction. For any other proportions the joint will be weaker, unless it can be shown that the tearing and crushing strengths of the metal are unequal, in which case the areas resisting those strains should be made inversely as the strengths.

There is no indication in the report published that the crushing of the metal was once taken into consideration.

The plate is simply said to have broken or cracked when the rivets did not shear.

Taking the data as given, I have assumed that when the rivets did not shear, the plates tore asunder. The percentage of strength reported is compared with the percentage of rivet

columns are copied directly from the tables already published; the fourth column shows the width of plate in the clear between rivet holes, the fifth contains the product of the first and fourth, the sixth gives the area exposed to shearing—per rivet for single-riveted joint, per two rivets for double-riveted joint; the seventh contains the product of the first and second.

Since the width of the plate was not given in many instances, it has been assumed to be an exact multiple of the pitch. For the purpose of comparison the areas pertaining to one length of pitch are taken, so that the gross area of plate will be the product of the thickness by the pitch (or column one by column three). This is not given in the tables, but is the divisor for the values in the fifth, sixth and seventh columns, giving the ratios shown in the eighth, ninth and tenth columns respectively.

The ratio in the thirteenth column is found by subtracting the twelfth from the eighth, and dividing the difference by the eighth in case of tension; or by subtracting the twelfth from the ninth, and dividing by the ninth in case of shearing.

For joints which have both broken and sheared, both comparisons have been made. The result is the ratio of loss of strength in the net area under strain to the strength of the same area before being made into a joint.

In shearing the loss averages 11.8 per cent. in the single lap joints, and 19.4 in the double lap joints; an average of all the examples gives a loss of 12.2 per cent. That is to say, if the tensile strength of the plate is 60,000 lbs. per square inch, the shearing strength of the rivets in the joint is less by 60,000 x 0.122=7,320 lbs., or is 52,680 lbs. per square inch. It is customary to consider it 20 per cent. less.

The average loss of strength in the net section of plate in lap joints single-riveted is shown to be 25.1 per cent., the

book may readily be checked with the freight received book in case of a discrepancy existing in the freight accounts.

Agents must carry into the total of the way-bill columns the total footings of the way-bills as they appear; this must be done for the purpose of readily checking the freight received book with the monthly abstracts of way-bills received.

He must also see that the total of way-bill columns agrees with the total of consignment column, and at the close of the month see that the total of the freight received book agrees with the total of the monthly freight report, which shows the aggregate amount of freight received from each station, and the total of the whole.

Way bills received after the close of the month must be entered in the account of the month in which they are billed and dated.

Way bills (except bulk grain bills and others of that character, where it is impossible to get the quantities until the accounts for the month have been closed) are never carried forward to the subsequent month.

When commencing a new month's account, agents must leave as many pages blank on the freight received book as may be necessary for the entry of the bills, dated in previous month, yet to arrive.

It is of especial importance that the freight received and receipt book should in all cases show date of delivery of freight and also the signature of consignee, or their authorized agents, acknowledging the receipt of freight.

Agents are required to notify consignees immediately upon the arrival of freight, and in the event the freight bills are not at once paid and the goods taken away, agents are expected to use such personal solicitation as would seem most likely to accomplish the object, without, if possible, offending the patrons of the company.

Agents must not accept or remit checks, drafts or notes, in payment of amounts due the company, unless especially authorized to do so by the Local Treasurer.

All checks or drafts received must be drawn to the order of the agent, and must be properly indorsed by him before being remitted.

All notes received must be drawn to the order of the company, and must, in all cases, be indorsed by two good and responsible parties.

Notice of the arrival of freight: unless directed to the contrary by an authorized officer of the company, the cost of the postage stamp (if the notice is sent through the post office) must in all cases be added to the expense bill and collected of the consignee, but the amount must not appear on the cash book.

At stations where notices are to be sent at the company's expense, printed postal cards will be used, and will be furnished upon requisition by the stationery supply clerk.

The use of postage stamps furnished by the company must be restricted to the very fewest stations possible, and at such stations the stamps must be used only for certain specified purposes. No adequate check can in the nature of things be placed upon the disposition of the stamps by the party receiving them, and their general use on the line would involve an immense and ever-increasing expense to the company.

Instruct agents as follows in reference to freight expense bills:

Immediately after entering way bills on freight received book, make expense bills (to be signed when consignee pays charges) for the same directly from the way bill, and compare the amount of each expense bill with amount of consignment shown on the freight received book, as a check against errors of omission or otherwise.

Notations regarding the condition of freight, as "over," "short," etc., should be made, as previously explained, on the freight received book, but never on the expense bill.

The unpaid expense bills should be carefully guarded. Agents should sign and enter them on cash book, invariably, at time of payment.

Expense bills must be made to show exactly the amount called for by the way bill.

The plan of "simplifying" matters by arbitrarily adding enough to a consignment or expense bill to make the charges to be collected some even amount is strictly forbidden. Although avowedly done for the purpose of making graceful, this practice is peculiarly disreputable, alike disgraceful to all parties who practice or permit it. It also destroys a useful and necessary check upon the accuracy of the accounts.

Expense bills must be signed (receipted) with pen and ink; they must not be stamped.

In examining way-bills for freight received at stations, in the event of doubt as to what the correct amount should be, the greater sum should be entered for collection on the expense bill, and a correction sheet sent in accordance with the instructions; afterwards, in the event an overcharge is found to have been made, (and the way-bill has been altered,) the amount should be duly entered upon the overcharge book.

If the accounts for the month in which the overcharge occurred have been reported to the Freight Auditor when the bill was noted to the agent, then, and in that case, the overcharge cannot be refunded by the agent, but must be referred to the Freight Auditor for adjustment by voucher.

Cash Book.—The cash book gives in detail the total receipts and disbursements of the company at each station.

The cash book must be balanced daily and the balance due the company remitted by express as directed.

The cash book must be footed and closed each day, precisely as if the station were going to be abandoned.

In this way agents keep advised from day to day and know their accounts to be exactly right.

Agents are required to enter in the proper columns all receipts and disbursements of cash at the time of the transaction.

All entries on the cash book should show clearly the character of the entry and why made.

As a check upon errors in footing the cash book, and also to aid in checking the account at the close of the month, agents must carry forward from folio to folio, in red ink, the footings of the several columns on the cash book, from the beginning to the close of the month; or, in other words, they must carry forward the footings from day to day, as though the total business of the month were to be accounted for in one remittance at the close of the month.

They should compare and see that the amount of these several columns added together agrees exactly with the columns headed "total column" on the cash book.

A trial balance sheet should be made by agents on the last day of each month, so that any error or omission may be discovered and rectified before the last remittance for the month is sent in, thus securing a perfect general balance sheet for transmission to the Local Treasurer, when the accounts for the month are closed at stations.

Any errors that may occur after the trial balance is made, and before the monthly account current is sent forward, must be noted in the said monthly account in detail, giving, say, the number of way-bill and amount, or, generally, such information as may be necessary to a clear understanding of the case at the general office. The amount of errors of this character will be reported back on the Local Treasurer's correction sheet, to be carried forward and adjusted by the agent in the succeeding month.

No work should be deferred by agents until the end of the month that can possibly be done earlier.

In making the trial balance, if the amount of cash to be remitted, as shown by the cash book, does not balance the account as shown by the balance sheet, agents should check the account as follows:

Compare the total footings of the prepaid, ticket and advanced charges columns with the reports for each.

Carefully analyze the miscellaneous columns of the cash book, and compare them, item by item, with the trial balance sheet.

Compare the total amount of the remittance columns of the cash book, added to the amount of the remittances brought forward from the preceding month, and entered in the short column of the previous month's balance sheet, with the amount as entered on the trial balance.

In case the amount of remittances as shown by the balance sheet does not agree with the amount shown by the cash book, check the remittance items on the balance sheet with the cash book, item by item, until the difference is found; then refer to the remittance slip, as credited up by the Local Treasurer, to ascertain which amount is right, and if remittance entered on cash book differs from amount credited, make the necessary correction.

See that the entries on the overcharge book have been properly made, and that no credit has been taken on cash book for overcharges not yet refunded, and see that all overcharges that have been refunded are credited on cash book.

By thus analyzing the account, much time may be saved, as it demonstrates in a few minutes what portion of the account it is necessary to check in detail.

If there is still a discrepancy, see if the items which made up the debit balance from last month's account are properly accounted for in the remittances or other credits of the present month, and that the errors of the preceding month are properly adjusted on the overcharge book or cash book, as the case may require.

The balance may also be affected by some petty disbursement on account of the station, made by the agent during the month and carried as cash, awaiting the approval and payment of vouchers covering same.

Now check the cash book with the freight received book, and then see that the items not checked as appearing on the cash book are to be found on list of uncollected freight bills on hand.

In checking list of uncollected bills, some peculiar form of check mark should be used which plainly differs in appearance from cash check mark.

Carefully examine the list of uncollected and additional uncollected from previous month, and the freight received book account of current month, to see that every item is accounted for as either paid or uncollected, and also look carefully through cash book to see that nothing remains unchecked.

If an item remains unchecked on the cash book, see if it is not a duplicate entry, and, if it is, make proper adjustment for same in the miscellaneous column.

The whole account ought now to be in balance, as the several parts of the account have been proved.

If the account is not in balance, carefully examine the footings of the cash book; the uncollected freight of the present month; the columns on the balance sheet; or the uncollected freight of last month.

The balance of errors as shown on the correction sheet from the Local Treasurer should not be entered in a lump on the cash book, but the items of which it is made up should be carefully examined, and proper adjustment of each should be made on the overcharge book, or cash book, or elsewhere, as the merits of each case may especially require.

You will understand that the monthly correction sheet from the Local Treasurer, referred to above, is an official notice to the agent of the final result (as it affects his balance sheet) of the examination and audit of his accounts by the several departments. This sheet gives (for such items as are incorrect) the amount originally entered by the agent to his debit or credit and the amount as corrected; also the balance to be carried forward to the succeeding month's account.

Whenever a correction is made by the head of a department, which is not clearly understood, or cannot be located, agents must obtain a statement of same from the department interested, for entry on the proper books and in the proper manner.

(TO BE CONTINUED.)

—Mr. E. C. Perkins, traveling agent of the Nashua Iron and Steel Company, died recently at Albany.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Fall River.—At a special meeting held in New Bedford, Mass., April 11, the resignations of all the directors were presented and the following new directors were chosen: Charles T. Bonney, J. A. Beauvais, New Bedford, Mass.; Wm. Rotch, George Wilson, Fall River, Mass.; Harrison Bliss, Wm. H. Bliss, Worcester, Mass.; E. D. Hewins, Fitchburg, Mass.; John H. Perry, Boston; George B. Phelps, Watertown, N. Y. Messrs. Beauvais, Perry, Rotch and Wilson were re-elected. The board elected Harrison Bliss President, in place of J. A. Beauvais.

Cincinnati, Richmond & Fort Wayne.—At the annual meeting in Fort Wayne, Ind., April 4, the following directors were chosen: J. H. Moorman, A. F. Scott, Elwood Patterson, C. F. Coffin, Asahel Stone, Wm. Parry, A. McKew, D. Studebaker, Pliny Hoagland, F. H. Short, J. N. McCullough. The board elected Wm. Parry President; A. F. Scott, Vice-President; C. C. Binkley, Secretary and Treasurer. The road is leased to the Grand Rapids & Indiana.

Union Railroad, Transfer & Stock Yards Co.—At a meeting held in Indianapolis, April 10, the following directors were chosen: Horace Scott, George B. Wright, H. B. Hurlbut, John F. Miller, W. C. Holmes, John Thomas, E. F. Claypool, Indianapolis; W. R. McKeen, Terre Haute; M. A. Downing, Louisville. The board elected W. R. McKeen President; Horace Scott, Vice-President; E. F. Claypool, Secretary and Treasurer.

Leviathan & Auburn.—The following officers have been chosen for the ensuing year: President, James Dingley; Treasurer, J. L. H. Cobb; Secretary, W. F. Garcelon. The road is leased to the Grand Trunk.

Chicago & Alton.—At the recent annual meeting the following directors and officers were chosen for this company's leased lines: **Joliet & Chicago.**—Directors, John Crerar, John B. Drake, John McG. Adams, J. F. Slater, T. B. Blackstone; President, John Crerar; Secretary, W. M. Larrabee. **St. Louis, Jacksonville & Chicago.**—Directors, George Straut, T. B. Blackstone, C. D. Hodges, L. E. Worcester, N. W. Green, Josiah Sawyer, John Crerar; President, George Straut; Vice-President, T. B. Blackstone; Secretary R. H. Nolton. **Mississippi River Bridge.**—Directors, T. B. Blackstone, John J. Mitchell, John B. Drake, George Straut, H. V. P. Block; President, T. B. Blackstone; Secretary and Treasurer, C. H. Foster.

Maine Central.—At the annual meeting in Augusta, Me., Feb. 28, the following directors were chosen: Noah Woods, Bangor, Me.; Abner Coburn, Skowhegan, Me.; Darius Aiden, Augusta, Me.; Arthur Sowell, Bath, Me.; John B. Brown, Wm. G. Davis, Geo. E. B. Jackson, Portland, Me.; J. S. Ludlam, Lowell, Mass.; Samuel C. Lawrence, Alfred P. Rockwell, George P. King, Boston. The new directors are Messrs. Rockwell, Ludlam, King and Jackson, who succeed J. W. Johnson, Frank Jones, George L. Ward and J. P. Cook. The board subsequently re-elected Abner Coburn President and J. H. Drummond, Clerk.

Green Bay & Minnesota.—At the annual meeting in Green Bay, Wis., April 2, the following directors were elected: D. M. Kelly, Henry Ketchum, George Sommers, W. J. Abrams, M. D. Peak, F. S. Ellis, W. E. Peak, E. F. Hatfield, Jr., W. Scanton. The directors elected the following officers: President, H. Ketchum; Vice-President and General Manager, D. M. Kelly; Treasurer, W. B. Hancock; Secretary, W. J. Abrams; Superintendent, S. B. Kenrick.

Western, of North Carolina.—At the annual meeting in Fayetteville, N. C., April 5, the stockholders elected Col. L. C. Jones President, with the following directors: A. A. McKetham, E. J. Lilly, John D. Williams, A. P. Huse, R. T. Scanlin. At the same time the appointment of the following State directors was announced: P. F. Duffy, J. D. Melver, L. J. Haughton, C. P. Mendenhall. The board re-elected N. A. Stedman Treasurer; John M. Rose, Secretary and Auditor.

Ottumwa & Northern.—This company was organized at Ottumwa, Ia., recently and the following directors chosen: S. D. Carpenter, C. F. Blake, L. E. Gray, Theophilus Slutz, Samuel Gilmore, J. L. Taylor, J. H. Merrill, John Kirkpatrick, J. M. Hedrick, W. A. McGrew, P. G. Ballingall. The board elected J. L. Taylor President; W. E. Chambers, Secretary; C. F. Blake, Treasurer.

Vineland.—The bondholders, who bought this road at foreclosure sale four years ago, met recently in Camden, N. J., and organized a new company by electing the following directors: Wm. S. Sueden, Wm. G. Miller, Edward P. Miller, John A. Hance, of New Jersey; Jay Gould, Thomas Sheridan, John F. Bingham, New York. The board elected Jay Gould President. The road is worked as part of the New Jersey Southern.

Pennsylvania.—Mr. L. P. Farmer is appointed General Passenger Agent in place of the late D. M. Boyd, Jr. Like Mr. Boyd, Mr. Farmer began railroad work on the old Bellefontaine road; he was subsequently on the Indianapolis & St. Louis and the Missouri Pacific roads, and has been Mr. Boyd's assistant since 1872. He is quite a young man, and said to be a remarkably efficient officer.

Texas & Pacific.—Mr. Charles H. Chappell has been transferred to the Southern Division as Superintendent and Mr. J. S. Noble, late of the Southern, is made Superintendent of the Jefferson and Transcontinental divisions in place of Mr. Chappell. Mr. Chappell will also act as General Superintendent in case of the absence of that officer.

Illinois Central.—The office of division engineer is abolished and its duties will be performed by the division superintendents, to whom road supervisors will hereafter report.

Chenango Valley.—The officers of this company, successor to the Syracuse & Chenango, are: President, Jas. J. Belden; Vice-President, A. A. Howlett; Secretary, Henry L. Duguid; Treasurer, Joseph J. Glass; Superintendent, J. W. Brown; Executive Committee, J. J. Belden, A. A. Howlett, H. L. Duguid; Trustee of First Mortgage, Horace Candee.

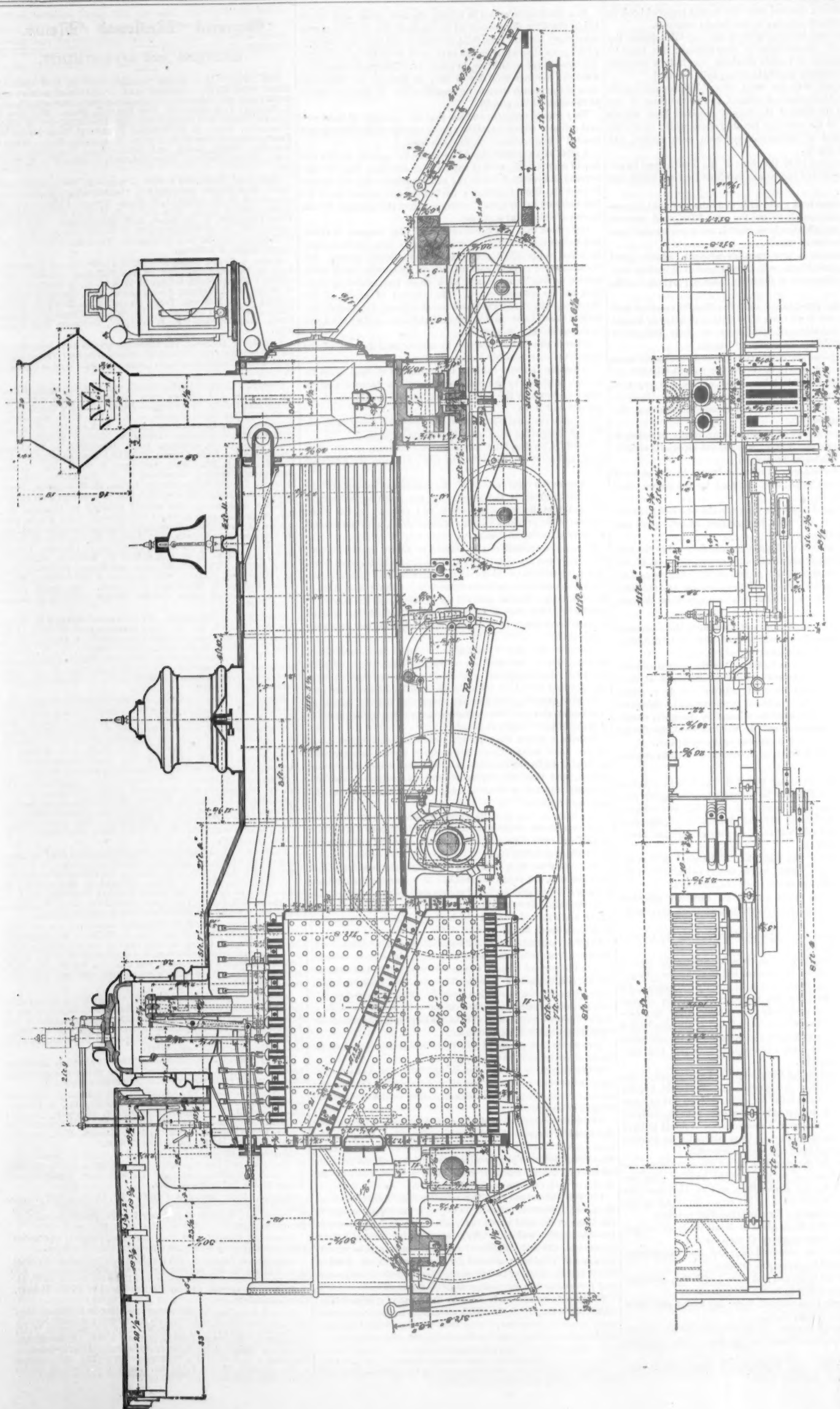
Washington City, Virginia Midland & Great Southern.—Mr. S. Spencer has been appointed General Manager, in place of Mr. G. J. Foreacre, resigned. He has been Supervisor of Trains on the Baltimore & Ohio.

Chicago, Rock Island & Pacific.—Mr. C. F. Jilson is appointed Auditor, in place of F. D. Sherman, deceased. Mr. W. G. Purdy, late Cashier, is appointed Local Treasurer, with office in Chicago.

Ohio & Mississippi.—Mr. S. B. Johnson, formerly connected with the Baltimore & Ohio, is appointed Chief Engineer.

Lake Erie & Louisville.—General Superintendent, I. H. Burgoon will act for the present as General Freight Agent. All correspondence on freight accounts will be addressed to W. H. Andrews, Treasurer, and on car movement to T. M. Hobart, Car Accountant.

Knox & Lincoln.—At the annual meeting in Rockland, Me., recently, the following directors were chosen: Edward Sewall, G. M. Patten, Edward Flynn, D. W. Chapman, Augustus Weld, Edmund Wilson, John T. Berry, Francis Cobb, Oliver Moses. The board elected John T. Berry President; L. S. Alexander, Treasurer; C. A. Coombs, Superintendent. The only change is the election of Mr. Berry as President in place of Oliver Moses, who declined to serve longer.



LOCOMOTIVE FOR NEW YORK CENTRAL & HUDSON RIVER RAILROAD, Reconstructed by Wm. Buchanan, Master Mechanic.

Miami Valley.—Mr. Charles Holman has been appointed Superintendent. He has been for several years a conductor on the Little Miami road.

Housatonic.—Mr. N. M. Brown has been appointed Assistant Superintendent. He will, for the present, continue to act as agent at Bridgeport, Conn., also.

Missouri Pacific.—Mr. M. Bullard has been appointed Train Master. He has been Acting Superintendent of the Western Division.

Houston & Texas Central.—Mr. A. H. Swanson has been appointed General Superintendent, in place of J. Durand, resigned.

Shenandoah Valley.—At the annual meeting in Front Royal, Va., recently, Mr. Wm. Milnes was re-elected President.

Cumberland & Ohio.—Mr. N. S. Ray, of Lebanon, Ky., has been chosen President, in place of Mr. W. H. Dulany, resigned.

Columbus & Hooking Valley.—At the annual meeting in Columbus, O., April 10, the following directors were chosen: M. M. Greene, William G. Deshler, Henry C. Noble, B. S. Brown, P. W. Huntington, W. B. Brooks, Isaac Eberley, C. P. L. Butler, H. W. Jaeger, John L. Gill, John D. Martin, C. H. Rippey, S. W. Pickering. There are no changes from last year. The board re-elected M. M. Greene President; J. J. Janney, Secretary and Treasurer.

Baltimore & Ohio & Chicago.—At the annual meeting of the Illinois company in Chicago, April 5, the three directors whose terms then expired were re-elected, as follows: James Walsh, John Tyrrell, Wm. Keyser. The board re-elected W. C. Quincy President; E. C. Winstanley, Secretary and Treasurer. At the annual meeting of the Ohio and Indiana company in Garrett, Ind., April 4, the following directors were chosen: W. C. Quincy, William Keyser, A. D. Smith, A. P. Edgerton, D. Lee, S. J. Anthony, W. C. Holgate, George B. Dennis, Worthington Cowan. W. C. Quincy was re-elected President and E. C. Winstanley Secretary and Treasurer.

Cairo & Vincennes.—Mr. F. A. Miller has been appointed Paymaster, in place of W. A. Oakley, resigned.

South Carolina.—At the annual election in Charleston, April 11, the following directors were chosen: Wm. J. Magrath, Wm. L. Trenholm, L. D. de Saussure, John Hancock, Andrew Simonds, George W. Williams, Henry Gourdin, Francis J. Pelzer, R. W. Cubbage, W. A. Courtenay, James S. Gibbs, C. O. Witte, Charleston; Moses Taylor, Samuel Sloan, J. P. Southern, New York. The board re-elected Wm. J. Magrath President. The new directors are Messrs. Cubbage and Witte, who succeed Daniel Tyler and Richard Lathers.

Allegheny Branch.—Mr. H. F. Barrows has been re-elected President and J. R. Bronson, Clerk.

Columbus & Toledo.—At the annual meeting in Columbus, O., April 11, the following directors were chosen: M. M. Greene, Wm. G. Deshler, D. S. Gray, Isaac Eberley, P. W. Huntington, E. L. Hinman, John Greenleaf, J. D. Van Daman, A. H. Kling, M. M. Carey, Samuel M. Young, Abner L. Backus, H. S. Walbridge. The board re-elected M. M. Greene President; J. J. Janney, Secretary and Treasurer.

Allegheny Valley.—At the annual meeting in Pittsburgh, April 10, the following directors were chosen: John Scott, Wm. M. Lyon, B. F. Jones, D. A. Stewart, Pittsburgh; Thomas A. Scott, George B. Roberts, S. M. Felton, A. J. Cassatt, H. M. Phillips, Philadelphia.

Chicago, Rock Island & Pacific.—At a meeting of the board held April 16 Mr. Hugh Riddle, late Vice-President and General Superintendent, was chosen President in place of John F. Tracy, resigned. Mr. David Dows, of New York, was chosen Vice-President. At the same time Mr. Frederick L. Ames was chosen a director in place of his father, the late Oliver Ames.

Atlanta & Charlotte Air Line.—The directors of this company, organized by the bondholders who bought the Atlanta & Richmond Air Line, are: Eugene Kelly, Alexander P. Irvin, Abram S. Hewitt, Wm. H. Fogg, George Warren Smith, P. P. Dickinson, John H. Fisher, H. C. Hardy, B. R. McAlpine, H. W. Sibley, New York; Douglas H. Gordon, Skipwith Wilmer, Baltimore. The officers are: H. W. Sibley, President; C. H. Pierce, Secretary and Treasurer; G. J. Foreacre, General Manager. The general office is in the Coal and Iron Exchange, Courtlandt street, New York; that of the General Manager at Atlanta, Ga. Mr. Foreacre was lately General Manager of the Virginia Midland road and was for a time General Superintendent of the Macon & Western.

TRAFFIC AND EARNINGS.

Coal Movement.

Tonnages reported for the week ending April 7 are as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite.....	388,453	407,582	Dec..	19,129 4.7
Semi-bituminous.....	82,863	86,776	Inc..	3,913 4.7
Bituminous, Pennsylvania.....	35,587	25,968	Inc..	9,619 36.9

The new arrangement between the anthracite companies, limiting the tonnage to competitive points, is not to go into operation until June 1.

The Cumberland trade is improving, and some large contracts are reported, including one of 20,000 tons for the Boston & Lowell Company at less than \$3 per ton on board ship at Locust Point.

During March the shipments of coal by water from the pools on the Monongahela River above Pittsburgh were 407,078 tons.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:	1876.	1875.	Inc. or Dec.	P. c.
Allegheny Valley.....	\$2,584,777	\$2,399,638	Inc..	\$185,139 7.7
Expenses.....	1,284,843	1,414,986	Dec..	130,143 9.2
Net earnings.....	\$1,299,934	\$984,652	Inc..	\$315,282 32.0
Earnings per mile.....	9,980	9,285	Inc..	695 7.7
Per cent. of exps.....	49.71	58.97	Dec..	9.26 15.7
Columbus & Hooking Valley.....	841,139	877,691	Dec..	36,552 4.3
Expenses.....	454,305	519,215	Dec..	64,910 12.5
Net earnings.....	\$386,834	\$358,476	Inc..	\$28,358 7.9
Earnings per mile.....	4,451	4,161	Inc..	290 6.9
Per cent. of exps.....	54.01	59.28	Dec..	5.27 8.9
Shenandoah & Fond du Lac.....	120,780	.....	.....	.....
Expenses.....	79,900	.....	.....	.....
Net earnings.....	\$40,880	.....	.....	.....
Earnings per mile.....	1,548	.....	.....	.....
Per cent. of exps.....	66.14	.....	.....	.....
South Carolina.....	1,126,437	1,229,303	Dec..	102,866 8.4
Expenses.....	647,753	780,728	Dec..	132,975 17.0
Net earnings.....	\$478,684	\$448,575	Inc..	\$30,109 6.7
Earnings per mile.....	4,655	5,080	Dec..	425 8.4
Per cent. of exps.....	57.51	63.50	Dec..	5.99 9.4
Southern Minnesota.....	636,841	623,610	Inc..	13,231 2.1
Expenses.....	413,197	364,942	Inc..	48,255 13.2
Net earnings.....	\$223,644	\$258,668	Dec..	\$35,024 13.5
Earnings per mile.....	3,746	3,668	Inc..	78 2.1
Per cent. of exps.....	64.59	59.00	Inc..	5.59 10.0

Three months ending March 31:

	1877.	1876.		
Atchison, Topeka & Santa Fe.....	\$400,505	\$441,796	Inc..	\$18,709 4.3
Burlington, Cedar Rapids & No.....	215,252	299,459	Dec..	84,217 28.1
Cairo & St. Louis.....	60,964	60,010	Inc..	954 1.6
Canada Southern.....	396,616	430,334	Dec..	33,718 7.8
Central Pacific.....	3,318,000	3,196,326	Inc..	121,774 3.8
Chicago & Alton.....	1,022,962	1,007,974	Inc..	14,988 1.5
Chicago, Milwaukee & St. Paul.....	1,249,469	1,612,301	Dec..	362,831 22.5
Denver & Rio Grande.....	135,140	95,859	Inc..	39,281 41.0
Illinois Central, Illinois lines.....	1,112,939	1,295,004	Dec..	182,065 14.1
Ind., Bloom & Western.....	275,818	379,548	Dec..	103,730 37.3
International & Great Northern.....	428,813	382,045	Inc..	46,768 11.6
Midland, of Canada & Missouri, Kansas & Texas.....	719,845	756,996	Dec..	37,151 4.9
New Jersey Midland.....	139,140	139,743	Inc..	603 0.4
St. Louis, Alton & T. H., Belleville Line.....	151,469	120,814	Inc..	30,655 8.8
St. Louis, Iron Mt. & Southern.....	1,079,610	998,344	Inc..	81,266 7.5
St. Louis, Kan. City & Northern.....	751,358	805,184	Dec..	53,826 6.7
St. Louis & San Francisco.....	914,718	910,293	Inc..	4,425 0.5
Toledo, Peoria & Warsaw.....	243,370	314,205	Dec..	70,835 22.5
Wabash.....	942,473	999,023	Dec..	56,550 4.7
Hannibal & St. Joe.....	418,900	473,300	Dec..	54,400 11.0

Two months ending Feb. 28:

	1877.	1876.		
Atchison, Topeka & Santa Fe.....	\$271,214	\$261,549	Inc..	\$9,665 3.7
Net earnings.....	99,874	121,661	Dec..	21,687 17.7
Per cent. of exps.....	63.17	58.52	Dec..	4.65 18.0
Burlington, Cedar Rapids & No.....	142,058	193,626	Dec..	51,568 26.6
Net earnings.....	28,505	61,620	Dec..	33,117 59.8
Per cent. of exps.....	79.69	68.04	Inc..	11.65 17.1
Cairo & St. Louis.....	61,670	57,867	Dec..	3,803 6.1
Net earnings.....	6,025	10,554	Dec..	4,529 42.7
Per cent. of exps.....	87.78	81.88	Inc..	5.90 7.6
Canada Southern.....	48,071	415,865	Dec..	58,506 14.1
Net earnings.....	125,639	112,764	Inc..	12,875 11.3
Per cent. of exps.....	65.00	72.86	Dec..	7.86 10.8
Chicago, Milwaukee & St. Paul.....	298,980	335,208	Dec..	36,228 10.8
Net earnings.....	125,566	139,210	Dec..	13,644 9.8
Per cent. of exps.....	57.99	58.51	Dec..	0.52 0.9
Chicago & Alton.....	30,618	42,833	Dec..	12,215 28.5
Net earnings.....	5,969	17,739	Dec..	11,770 66.5
Per cent. of exps.....	79.58	58.36	Inc..	21.22 36.6
St. Louis, Iron Mt. & Southern.....	729,610	639,306	Inc..	90,304 14.1
Net earnings.....	329,227	265,450	Inc..	63,777 24.0
Per cent. of exps.....	54.58	58.51	Dec..	3.93 6.3
St. Paul & Sioux City.....	60,006	83,301	Dec..	23,295 28.0
Net earnings.....	11,105	29,687	Dec..	18,582 62.6
Per cent. of exps.....	81.50	64.36	Inc..	17.14 26.8
St. Louis, Iron Mt. & Southern.....	33,076	63,114	Dec..	30,038 37.7
Net earnings.....	2,187	12,971	Dec..	10,784 83.0
Per cent. of exps.....	93.60	76.74	Inc..	17.86 23.5
Union Pacific.....	1,666,464	1,362,135	Inc..	304,329 22.3
Net earnings.....	1,015,931	541,087	Inc..	474,844 87.4
Per cent. of exps.....	99.10	60.80	Inc..	11.40 18.8

Month of January:

Denver & Rio Grande	\$41,858	.....	.....	.....
Net earnings.....	16,602	.....	.....	.....
Per cent. of exps.....	60.33	.....	.....	.....

Month of February:

Atchison, Topeka & Santa Fe.....	\$136,350	\$144,132	Dec..	\$7,782 5.4
Net earnings.....	57,925	75,757	Dec..	17,832 26.2
Per cent. of exps.....	57.52	47.44	Inc..	10.08 21.3
Denver Pacific.....	24,070	.....	.....	.....
Louisville & Nashville.....	421,836	410,394	Inc..	21,442 5.2
Net earnings.....	187,097	156,141	Inc..	30,956 6.6
Per cent. of exps.....	62.73	62.91	Inc..	0.18 0.3
Union Pacific.....	851,190	697,138	Inc..	154,052 22.1
Net earnings.....	522,129	348,270	Inc..	173,859 49.9
Per cent. of exps.....	38.65	50.00	Dec..	11.35 22.7

Month of March:

Atchison, Topeka & Santa Fe.....	\$189,291	\$180,247	Inc..	\$9,044 5.0
Net earnings.....	73,194	105,849	Dec..	32,655 30.9
Per cent. of exps.....	20.87	19.347	Inc..	1,504 6.9
Cairo & St. Louis.....	185,682	165,431	Dec..	20,251 11.0
Canada Southern.....	1,242,000	1,184,683	Inc..	57,317 4.8
Central Pacific.....	346,308	355,527	Dec..	9,219 2.6
Chicago & Alton.....	469,000	667,643	Dec..	198,643 42.4
Chicago, Milwaukee & St. Paul.....	49,944	31,672	Inc..	18,272 37.6
Denver & Rio Grande.....	373,094	417,081	Dec..	44,047 10.6
Illinois Central, Illinois lines.....	90,474	105,513	Dec..	15,039 12.6
International & Great Northern.....	116,000	95,523	Inc..	20,477 21.4
Louisville & Nashville.....	412,983	374,117	Inc..	38,866 10.4
Missouri, Kansas & Texas.....	247,505	245,814	Inc..	1,691 0.7
Net earnings.....	46,305	42,584	Inc..	3,721 8.7
St. Louis, Alton & T. H., Belleville Line.....	43,223	42,239	Inc..	984 2.3
St. Louis, Iron Mt. & Southern.....	350,000	299,038	Inc..	50,962 17.0
St. Louis & San Francisco.....	108,182	102,639	Inc..	5,543 5.4
Toledo, Peoria & Warsaw.....	84,220	107,739	Dec..	23,519 18.0
Wabash.....	312,529	315,365	Dec..	2,836 0.8
Hannibal & St. Joe.....	160,000	174,300	Dec..	14,300 8.2

First week in April:

Atchison, Topeka & Santa Fe.....	\$48,330	\$43,789	Inc..	\$4,541 10.4
Net earnings.....	111,000	157,200	Dec..	46,200 29.4
St. Louis, Iron Mt. & Southern.....	72,400	75,703	Dec..	3,303 4.4
Denver & Rio Grande.....	12,254	.....	.....	.....

Three weeks ending April 6:

Great Western, of Canada.....	\$211,908	\$222,163	Dec..	\$10,555 4.7
Grand Trunk.....	\$333,302	\$355,783	Dec..	\$22,481 15.6

Grain Movement.

San Francisco grain shipments for March were 62,453 barrels of flour and 920,320 bushels wheat. For the nine months of the California crop year ending March 31 the shipments were:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Flour, barrels.....	433,953	353,600	80,353	22.7
Wheat, bushels.....	16,999,290	9,200,667	7,798,623	83.7
Total, bushels.....	19,069,085	10,968,667	8,100,418	73.9

Ross Winans.

Ross Winans, the distinguished machinist and inventor, died at his residence in Baltimore, April 11, at the advanced age of eighty-one years. He was the proprietor of the shops at which

many of the locomotives used by the Baltimore & Ohio Railroad Company were built. He never served an apprenticeship to the business in which he acquired so much distinction, and prior to his removal to Baltimore was a farmer in New Jersey. He came to Baltimore about the year 1830, and bought an interest in the shop at which the Baltimore & Ohio Railroad Company was having a couple of engines built as an experiment. The cars which ran over the eight or ten miles of its track which was in operation at that time were drawn by horses. Mr. Winans, though not a practical mechanic, was an expert draughtsman, and for the next thirty years of his life devoted himself to the designing of railroad cars and locomotives. The heavy freight engine known as the camel back is his invention, and he also claimed to be the original inventor of the passenger railroad coach as now constructed. His shop became famous throughout the country and he built locomotives for many of the Northern railroads, particularly those engaged in the transportation of coal. Unlike most inventors, he was a shrewd business man, and amassed a large fortune. His business was increased by fortunate investments in real estate.

In 1856 the Baltimore & Ohio Railroad Company decided to discontinue the use of the camel back locomotive, and this led to a bitter controversy with Mr. Winans, who wrote many pamphlets in defence of the engine on which he had expended so many years of patient thought and labor. Having already amassed a large fortune he cared nothing for the profit of building them, but to use his own words, he was fighting for the cause of truth and science. Mr. Winans' pamphlets could not prevail against the hard facts of experience, and his pet locomotive has disappeared from the Baltimore & Ohio and all other railroads. Mr. Winans retired from business not long after the camel back fell into disfavor. He was an ardent sympathizer with the South during the rebellion, and was a member of the Frederick Legislature when that body was put under arrest by order of General McClellan. After his arrest and imprisonment by the federal authorities Mr. Winans took but little part in public affairs. He owned a large tract of land a short distance from the city, and upon this he made many experiments in scientific agriculture. He also spent much time in devising plans for the improvement of the condition of the poor, and some years ago he built two blocks of tenement houses after an original design, which he intended to lease to mechanics and laboring men at low rents. Although the houses were well finished and comfortable in every respect, the people for whom they were intended refused to live in them, and they have for the most part been tenanted. Mr. Winans was a sort of amateur theologian, and wrote several books and many pamphlets upon religious subjects. He was very far from being orthodox in his religious belief. He has two sons, who inherited his inventive genius, and both of them have acquired much notoriety in connection with the "Winans cigar steamer." One of them has been in England for the last eight or ten years experimenting with a vessel constructed on this plan and trying to make it a practical success. His other son, Thomas Winans, made a great fortune in the construction of railroads in Russia, and married a lady in that country. He is now one of the Baltimore millionaires.—*New York Herald.*

[We have in preparation a more extended account of Mr. Winans' life and professional career and achievements which we expect to publish soon.—EDITOR RAILROAD GAZETTE.]

Locomotive for New York Central & Hudson River Railroad.

Our engraving this week represents a longitudinal section and half plan of the engine of which a side elevation and other views were published last week. The construction of the fire-box, which is patented by Mr. Wm. Buchanan, is apparent from the engraving. It consists of an inclined "water table" which extends from the back flue-sheet backward and upward and divides the fire-box into two parts between which the only communication is an opening, about the size and form of an ordinary fire box door opening, in the water table, through which all products of combustion must pass. They naturally come into closer contact with each other in passing through this opening than they would in an ordinary open fire-box, and by admitting a supply of air above the fire, it becomes mixed with the gases both in passing through the opening in the water table and afterward in what may be called the second chamber of the fire-box. These engines burn the fuel with less smoke than any others that have come under our observation.

All the passenger engines and a few of the freight engines on the Hudson River road now have this form of fire-box. The following is a statement of the performance of one of these engines with passenger trains:

Total miles run.	No. of trips.	Miles per trip.	Cars per trip.	Miles per hour.	Coal in lbs. consumed per trip.	Lbs. per mile.	Lbs. per car mile.
1,716	12	286	6	37½	8,271½	28½	4½

Heavy winds both ways.

A



Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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Editorial Announcements.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

THE ST. LOUIS, IRON MOUNTAIN & SOUTHERN REPORT.

This company has now twice failed to meet its obligations, and doubtless its creditors will take unusual interest in the report of 1876. Early in 1875, it became evident that the road could not meet all the interest on its large funded debt and at the same time reduce in any degree its immense floating debt. The latter was \$3,254,000 at the beginning of 1875, which is at the rate of \$4,750 per mile of road owned, and twice as much as the net earnings of an entire year. The mere existence of such a debt, however satisfactory earnings may be, is a great drawback on the economical working of a road. So many renewals and extensions are required, the company's paper is so widely scattered, it comes so often into the money market for accommodation, that its credit is injured; and this is felt in its supply bills and generally lessens its ability to get the best materials and service in the market at the lowest prices. In February of 1875 an arrangement for funding coupons was made on all the company's bonds except the St. Louis & Iron Mountain firsts, which are a first lien on the line from St. Louis to Pilot Knob and from Bismarck to Belmont—the 210 miles of the road with the heaviest traffic. By this arrangement, the yearly interest, which, neglecting the premium on gold, would have been \$1,750,000, was reduced to about \$650,000 in 1875, and was to have been \$742,448 in 1876 (including interest on funded coupons); while the coupons funded for 1877 amounted to but \$39,600. Before this time it was estimated that the floating debt would have been retired and the company have full control of all its net earnings for the payment of interest on its funded debt, which interest by the operation of the funding scheme is increased to \$1,910,000 yearly, nearly all in gold, which is at the rate of \$2,784 per mile of road.

The company was to resume payment in full on the second-mortgage bonds last November. This it was unable to do; but it paid half the face of the coupons and returned them with this payment endorsed on them without making any further agreement with the bondholders, who are thus left at liberty to exercise their right of foreclosure if they choose.

The company's net earnings since 1874 have not been

quite sufficient to meet all the interest on the bonds; but they have not lacked much of it, though probably most of the expenditures charged to construction since that time, amounting to about \$400,000, were quite as unavoidable as the working expenses, as often happens on railroads. This does not show that the actual net earnings were less than reported, but that the available net earnings were less than the actual. If the company's credit was good, the additions could have been provided by sales of securities which would add to the capital account; but in the case of the Iron Mountain, these expenditures had to be taken from the money due the bondholders.

With the floating debt it was different; the bondholders are preferred creditors, known as such, and they have the power and right to enforce their lien on the property by foreclosing their mortgages, which would have extinguished the floating debt as well as the capital stock of the company.

They chose not to do this, however, but agreed to a plan by which they took their own pay for a time in the company's paper, and permitted the earnings due them to be paid to the floating debt creditors. This operation was equivalent to the purchase of the floating debt by the bondholders, or an additional loan by them to fund that debt. That it was a sacrifice on their part is shown by the fact that while floating-debt creditors were to get cash for their dues, the paper which the bondholders took is not worth more than 60 cents on the dollar. Doubtless they believed that this was the best they could do; that the difficulties and dangers and delays of a foreclosure and reorganization more than counterbalanced the losses by the funding scheme; and quite probably they were right. And doubtless they expected that the property by which their loans were secured would be so much improved by the retirement of the floating debt that their bonds would be enhanced in value and the probability of the prompt payment of their interest be much increased; and in this they were certainly right. Still, the only reward they could receive for their course was the payment of their just debts. On the other hand, it saved the stock from annihilation and the floating debt creditors from the loss of nearly all their dues.

The arrangement with the bondholders having been made for the purpose of retiring the floating debt, it is interesting to observe what progress has been made in this direction. The balance sheets for Jan. 1, 1876 and 1875 compare as follows with regard to the floating assets and liabilities:

Liabilities:	1875.	1876.
Due sundry roads and accounts audited.....	\$480,451 06	\$560,987 94
Bills payable in New York.....	798,327 25	327,159 69
" " St. Louis.....	224,465 67	371,682 99
New York temporary loan account.....	487,418 20	319,365 06
Interest on bonds accrued.....	80,565 00	468,185 00
Auditor's warrants outstanding.....	52,745 32	
Accrued interest on certificates.....		69,518 75
Total.....	\$2,063,972 59	\$2,111,849 43
Assets:		
Due from sundry roads and persons.....	\$312,958 16	\$304,713 52
Bills receivable.....	24,259 51	12,861 84
Missouri and Arkansas trust land notes.....	304,586 36	407,310 03
Cash in hands of Land Commissioners and Union Trust Co.....	13,013 54	11,063 08
Materials on hand.....	173,919 33	264,694 26
Cash on hand.....	40,832 74	35,798 40
Total.....	\$860,569 64	\$1,036,441 13
Excess of liabilities.....	\$1,224,402 95	\$1,075,408 30

The decrease is but about \$150,000 for the last year; but it would have been nearly four times as great but for the fact that a part of the coupons which were not paid in 1876 appear as a floating debt, while the year before, though due and unpaid just the same, they were funded, and so did not increase the floating debt. There is, too, a considerable increase in the stock of supplies. The burdensome part of the debt is probably the bills payable, which were reduced within the year from \$1,480,211 to \$1,018,187.

The income account shows that the net earnings lacked \$416,950 of meeting the interest on all the bonds, the funded coupons and the floating debt, counting but \$33,700 for premium on gold coupons, which is probably the premium only on those actually paid.

Thus, without paying any of the floating debt, the earnings would not have sufficed to meet the interest on the bonds, which (including that on funded coupons) amounted to just about \$1,900,000. After paying expenses (including a considerable sum for expenses—chiefly taxes—of preceding years) and the interest (\$121,000) on the floating debt, \$1,412,650 remained. Then \$228,500 was expended for construction, thus leaving less than \$1,200,000 for both floating debt and interest on bonds. If the floating debt is retired at the rate of \$400,000 a year, and expenditures for construction, etc., are necessary to the same extent as last year (which is probable enough, the road being new and not provided with everything it wants), it would appear that the net earnings should be about a million dollars, or 60 per cent. more than last year, in order to meet the coupons as they mature, the funding scheme now having expired, and all the coupons being payable as before it was made. The earnings so far this year show a great improvement, but it cannot be expected that they will yield so large an increase of net earnings. Apparently, there is no prospect of paying the

whole interest and extinguishing the floating debt rapidly at the same time. The courses open seem to be the funding of more coupons for a time, which the bondholders will probably object to; the postponement of the payment of the floating debt, which the floating-debt creditors will not like, and which will be bad for the road; and the foreclosure of the mortgages and extinguishment of the floating debt, which would require time, be in many respects demoralizing to the road for a considerable period, and could not be effected satisfactorily—that is without otherwise unnecessary delay and expense and danger—unless with the consent of the company.

The road has a heavy indebtedness for one so new, and this is the cause of its misfortunes; for its earnings are quite good, and the profits would pay 7 per cent. interest on a capital of \$32,000 per mile. It has a growing business, too, the gross earnings of 1876 being 5 per cent. greater than those of the previous year, the tonnage mileage increasing 10 per cent. and the passenger mileage 16 per cent. The traffic is very evenly divided between north-bound and south-bound, and about 40 per cent. of it is local, and the average rates received are high enough to be profitable. The road carries a great deal of cotton (273,000 bales in 1876 against 159,600 in 1875), five-eighths of which comes from Arkansas, on the line of the road; and every evidence of progress in Arkansas is encouraging to this road, for it may be said to have half the State to itself. The iron traffic, which formerly was the main support of the road, or rather of the old Iron Mountain road, did not increase in 1876; but it is likely at some day not very distant to be very large; the cattle traffic, which it was once thought would be almost enough to support the road, as this is the shortest route from the Texas pastures to the Eastern markets, is not very large and does not grow—at least did not in 1876, when the road carried 2,468 car-loads, against 2,656 in 1875—not a month's business for some of the Chicago roads. Of the entire tonnage carried last year, 28 per cent. was merchandise, 34 per cent. agricultural products, 12 per cent. lumber, and the balance, 26 per cent., minerals, of which 21 per cent. was iron and iron ore.

The company's report contains a more detailed account of the items of working expenses than most, which is praiseworthy. It sums up part of the cost of working as "general expenses," and reports only the rest as "operating expenses," which is contrary to the usual practice and phraseology, and might mislead inattentive readers. It also makes some charges for "renewals" which are apparently what would ordinarily be classed with maintenance expenses, of which, indeed, renewals form a part.

No mention is made in the report of the controversy of the management with the Barings concerning the control of the road, nor is there apparent any effort to defend the policy of the management, nor does the report offer any plan for extricating the company from the difficulties in which it is placed by its inability to resume payment of its coupons in accordance with the terms of the funding scheme of 1875. The President simply states that "in view of the condition of the finances in October last, the board, acting upon the suggestion of some of the largest bondholders, decided that the time had not arrived to resume payment of the interest in full on all classes of our bonds, as was intended on and after Nov. 1, and therefore appealed to the bondholders to accept for the present half payment of their coupons upon all classes of the bonds, except on the first mortgage bonds (Iron Mountain), upon which payment would continue to be made in full." Mr. Allen says that this proposition was generally accepted, "and the payments of the interest, as promised, punctually made." And he adds that "the directors feel confident that during 1877 the earnings of the company will be materially increased, the floating debt gradually reduced, the property maintained in good condition, and the payment of the interest [meaning half interest, we suppose] continued."

Although some of the heaviest bondholders are dissatisfied with the management, and, as is known, are endeavoring to change it, as they claim that they have the power and the right to do, we have not heard that they threaten foreclosure, which course is apparently perfectly open to them. Perhaps, however, if they should secure a management in their interest, they would be more inclined than now to foreclosure, as then the suit of the bondholders to enforce their lien might be disbarred of the opposition of the corporation, and the bondholders' management might be made such as would be continued after reorganization, thus avoiding many of the complications likely to arise in case of a foreclosure opposed by the company.

LOSS OF HEAT BY RADIATION.

Mr. J. C. Hoadley, of Lawrence, Mass., the well known builder of portable engines, has recently made some very interesting and useful experiments which are published in the *Journal of the Franklin Institute* for April, to determine the amount of heat which is lost from the boilers of portable engines, and also the difference of the loss between boilers which are covered or clothed and those which are not, or are naked. The experiments were made

with a sixty horse-power portable engine and boiler, of which the following are the principal dimensions:

Cylinders.....	12 1/2 x 18 in.
Inside diameter of barrel of boiler.....	38 "
Thickness of plates.....	3/8 "
Size of fire-box, inside.....	54 x 33 "
Number of flues.....	63
Size.....	2 in. diam. x 9 ft. long
Total heating surface.....	402.24 square feet

The method of making the experiments is described as follows:

"After the boiler of this engine was tested with 150 lbs. pressure and without being covered, steam was reduced to atmospheric pressure with water at about the normal water line (2 1/2 in. above the top of the crown sheet), and a good fire of dry wood was started, with the safety valve wide open. When the fire was at its hottest, with a good mass of glowing coals and partly burned wood at the bottom, the fire-box was filled with a compact firing of dry wood, and the safety-valve was closed." The time required for each 10 lbs. increase of pressure was then carefully noted.

It was assumed that the heating value of the fire was sensibly constant during the period of time, 32.4 minutes, occupied in raising steam pressure from 0 to 140 lbs. pressure above the atmosphere. Although this assumption can hardly be exactly correct, it was shown that for the purposes of the experiment it was quite near enough. This was done as follows: As the weight of the water in the boiler and that of the boiler itself and its attachments which were heated by the steam and hot water were known, and as we know how much heat measured in thermal units is required to raise a given weight of water from a temperature of 212 degrees, the temperature of water under steam of atmospheric pressure, up to the temperature due to a pressure of 140 lbs. above the atmosphere, and as the specific heat of iron is also known, we can tell how many thermal units will be required to raise a given weight of it up to the same temperature. The quantity of heat thus transmitted to the water and the boiler was calculated in this way, allowance being made for the modification of the specific heat of the water by temperature, and the "augmenting weight of steam in the steam-space and its diminishing ratio of increase of heat." When the total quantity of heat contained in the boiler and the water and the number of minutes required to transmit it are known, it is of course easy to calculate the number of units of heat imparted per minute or for any other time. With these data the time required for each increase of 10 lbs. pressure was computed, and is given in the second column of the following table, with the observed time in the third column, as indicated by the experiment:

1 Pressures by steam-gauge pounds per square inch.	2 Computed time in minutes of in- crease in pres- sure.....	3 Observed time in minutes of in- crease in pres- sure.....	4 Loss of pressure by radiation from naked boiler in minutes.....	5 Percentage of loss of pressure by radiation from naked boiler.....	6 Loss of pressure by radiation from clothed boiler, minutes.....	7 Percentage of loss of pressure by radiation from clothed boiler.....
0 to 10	5.0	7.5				
10 " 20	3.5	4.3				
20 " 30	2.8	3.3				
30 " 40	2.3	2.5				
40 " 50	2.0	2.1				
50 " 60	1.8	1.9	18.0	10.6	41.1	4.6
60 " 70	1.6	1.7	16.0	11.3	37.5	4.5
70 " 80	1.5	1.4	13.7	10.2	32.5	4.3
80 " 90	1.3	1.3	12.1	10.7	29.9	4.3
90 " 100	1.2	1.2	10.9	11.0	24.3	4.9
100 " 110	1.2	1.2	9.4	12.8	21.0	5.7
110 " 120	1.1	1.1	8.5	12.8	19.2	5.7
120 " 130	1.0	1.0	7.6	13.2	18.8	5.3
130 " 140	1.0	1.0	7.3	13.7	17.3	5.8
Mean.				11.8		5.0

Mr. Hoadley makes the following comments:

"From this comparison it would appear that the fire gained in intensity during the first nineteen or twenty minutes, while the steam pressure was going up to 50 lbs., and from that point remained sensibly constant, there being substantial agreement between the observed and computed times.

"When a pressure of 150 lbs. had been reached, the fire was rapidly withdrawn, removed to a little distance and quenched. A well-fitted door of battened boards was placed underneath the fire-box ring or hoop and wedged up closely, so as to effectually close up the opening under the grate generally enclosed by the ash-pan. The smoke-pipe was also removed and the outlet of the smoke-box was closed. During these operations the steam pressure first rose and then fell a few pounds.

"Cooling was thus reduced to radiation from the outside of the naked boiler, including the steam jacket of the cylinder. The time occupied in falling from 150 lbs. to 50 lbs., was carefully noted from each 10 lbs. of pressure."

The results are given in the fourth column of the table, and should be read from the bottom upward.

It is obvious that if it took 1 minute to raise steam from 130 to 140 lbs. pressure, as shown in the third column, and 7.3 minutes to lose the same pressure by radiation, then

1.0
7.3
of the heat imparted to the boiler by the fire would escape from its surface and be lost by radiation during the

time that the steam was generated; and that if it took 1 minute to raise steam from 120 to 130 lbs. pressure and 7.6 minutes to lose that pressure by radiation, the loss from

the latter cause during that time would be 1.0
7.6 These frac-

tions are equivalent to 13.7 and 13.2 per cent. The loss due to radiation from the naked boiler has been calculated in this way, and is given in percentages of its efficiency in the fifth column of the table. Mr. Hoadley remarks:

"There are some slight irregularities, owing probably to the

manner of conducting the experiments; but the several ratios are on the whole mutually confirmatory.

"The boiler was afterwards clothed, first with three-quarters of an inch of asbestos cement, securely held in place by a sort of 'lathing' of wire cloth of 1/4 in. mesh, and over the asbestos a covering of hair felt, which, when slightly compressed by the outer casing of galvanized sheet iron, was also about 1/4 inch thick, making the whole covering about 1.5 inches. Around the smoke-box the entire thickness was of asbestos cement. The covering was complete over the fire-box casing, including the door end as well as around the barrel of the boiler, but did not extend over the steam-jacket casing of the cylinder. There was also a space about 6 inches in height at the bottom of the fire-box, all around, which was left uncovered for convenience of access to hand-holes, mud-plugs and blow-off cock. This space, in setting, can mostly be covered with brick work.

"The process of raising steam was not again noted, as it was thought to be impracticable to make a second fire which should be known to be sufficiently like the first one to admit of useful comparison; but loss of pressure by radiation was carefully noted, the time being taken as each successive pound was reached, as well as each 2.5 lbs., the steam gauge being graduated to pounds."

The time is given in the sixth column of the table, and the percentage of the saving is worked out as before and is given in the seventh column. At the bottom of the fifth and seventh columns the mean of the percentages is given, from which it will be seen that the loss by radiation from a naked boiler is 11.8 per cent. and from a clothed boiler it is only 5 per cent., or less than half of the former.

These experiments are the only ones that we know of in which an attempt has been made to determine the amount of the loss from radiation. It must be kept in mind that the experiments were made on an engine which, while they were made, was stationary, and was protected from the weather by the building in which it was placed. The conditions were therefore much more favorable than they are on a locomotive engine, which, while at work, is always exposed to the wind, rain and cold air, and its motion produces currents by which whatever heat can escape is rapidly carried off. As a rule it is true that locomotive boilers and engines are better clothed than ordinary stationary and portable engines, but a very large portion of the boiler is often left unclothed. It is seldom that the fire-box shell or casing is more than half covered. All the attachments to it are so many means of communicating heat from the boiler to the surrounding air, and the lagging itself is not by any means the best non-conductor of heat. On a tank engine that came under the writer's observation, the fire-box shell was covered with boards 1/2 in. thick, and outside of that tank iron, and the coal bunkers were placed so that the coal rested against the part of the fire-box shell covered in this way, the heat of which was so great that it frequently set fire to the coal. The outside of the lagging of the cylinder part of a locomotive boiler is always so hot, with steam on, as to burn a person's hand if laid on it. The cold air sweeping over this must carry away a great deal of heat, and notwithstanding the fact that the fire-box shell is partly covered by the cab, the loss of heat from this portion must be very much greater than that from a portable engine like that with which Mr. Hoadley made his experiments.

Although some effort has been made to protect the cylinders and steam chests of locomotives, it is very doubtful whether this is being done as effectually as it might be. If we examine the steam chest and cylinder head casing, we find that it consists of cast-iron covering which bears against the cylinder casting itself, and thus becomes the means of communicating heat directly from the latter to the outside. Those steam pipes which are contained and form a portion of the bed casting and cylinders are in direct communication with the external air. Often the inside of the pipe approaches very closely to the surface of the casting without any protection whatsoever. In this way there is a leak at the very last moment before the steam is used, and the steam, instead of entering the cylinder dry and at a high temperature, has lost part of its heat and is partly condensed or in condition in which it will be as soon as it does any work. To permit such a loss of heat is like losing food which is all cooked and prepared at the very moment a person is about to eat it. The difficulties of having the steam used in locomotives dry and free from moisture when it enters the cylinders is certainly sufficiently great without permitting the heat to escape from it while, like the food, it may be said to be all ready cooked.

Generally, too, it may be safely assumed that if the steam-generating capacity of a locomotive boiler is increased, the loads the locomotive will haul will be in like proportion. Now if, say, five per cent. of the steam, or, what is its equivalent, heat, is saved, then the locomotive will take that proportion more of cars, and do it without any additional expenditure of fuel or cost of labor. The economy is obvious.

It is, of course, true that the generation of steam in a locomotive boiler is so extremely rapid that a given amount of loss by radiation forms a smaller relative proportion to the efficiency of the boiler than in stationary engines; but it is also true that the boiler, cylinders and steam pipes of locomotives are much more exposed to a loss of heat than in any other class of engines. The fact that such

loss is entirely invisible and intangible makes it much more difficult to have the evil cured. If an engine should be run with a tender from which five per cent. of the fuel was lost and scattered along the track, a very short time would suffice to have the leak stopped; but when that proportion of heat escapes into "thin air," there is rarely a sufficient "scientific use of the imagination" to realize the extent or value of the loss.

The Reading Strike.

The contest between the Philadelphia & Reading Railroad and the Brotherhood of Locomotive Engineers is now fully developed. The enginemens struck last Sunday, those who were on trains taking them through to their destination, in accordance with the new Pennsylvania law, and as they were in duty bound to do at all events. Meetings of the Brotherhood have been held, and the society is said to support the strike heartily, and to offer good wages not only to its members who are thrown out of employment by the strike, but to outside men employed by the Reading road, intending, of course, to make it impossible for the company to replace the men who have struck. This policy would be likely to succeed in prosperous times, when the number of men, especially thoroughly qualified men, out of employment is small. But as things are, the Brotherhood undertakes a tremendous contract—little less than the employment at good wages of all the unemployed men in the country who can run a locomotive; and if the new employees have confidence in the ability of the Brotherhood to maintain this policy—to continue to pay them for not working—it will before long have an army on its hands sufficient to exhaust its resources in a short time. In these times, such a policy to succeed must succeed quickly. If the road must keep all or nearly all its trains running, it might have to surrender after a week or so. But not only are the times unfavorable to the success of a strike, by reason of the excess of the supply over the demand for enginemens, but the circumstances of the Reading Railroad are still more so. By far the larger part of its traffic is coal, and it can carry a whole year's production nearly as well in six months as in twelve. Moreover, by the recent agreement of the coal producers and carriers, a certain proportion of the whole business of the season is assigned to it, and if this agreement is kept its coal trains can be laid off from now till September without reducing materially its total coal traffic for the year, though not without great injury to other parties interested in the traffic. If then the company can keep men enough to run its passenger and freight trains, it can afford to be tolerably indifferent as to the rest, and go on hiring men daily for the Brotherhood to hire away from it until the latter has its hands full, and more. It is not as if the company lost a day's traffic for every day that its trains were stopped, as would be the case, nearly, with most roads.

The Reading Company seems to act on the assumption that the Brotherhood is a dangerous organization, proved such by its recent conduct on the Central of New Jersey, the Grand Trunk, and the Boston & Maine, as the Molly Maguires certainly were in its coal mines. In the strikes on these roads some things were done which were unjustifiable, and, we believe, illegal; but we should not on that account condemn the Brotherhood as insufferable. We insist that the men have the right to combine and to strike to support their claims. Whether the claims made in any of these cases were reasonable or unreasonable, we do not pretend to judge: they might be unreasonable and yet not prove the Brotherhood to be an organization which deserves to be destroyed; for nearly all of us are likely to make unreasonable claims for ourselves and enforce them if we can. So far as wages are concerned, the reasonableness or unreasonableness of claims sometimes cannot be decided (as things go) without resort to a strike, for otherwise we may not be able to ascertain the proportion of the supply to the demand for the kind of labor in question, and in such cases both sides to the strike may be right: they simply test the market in that rough way.

In the case of the Reading strike, it has probably seemed a point of honor with the Brotherhood to take its present position. In this case, really, it is the company and not the Brotherhood which strikes. The employer makes a new requirement of its employees, not contemplated in its original engagement of them, much as if the enginemens should have required as a condition of their remaining longer in the company's service, that it should withdraw from a coal combination, or change some other engagement which the men might think prejudicial to their interests. Moreover, the new requirement is based on the assumption that the society to which the enginemens belong is a bad one. It was not to be supposed, perhaps, that the men would submit to this without opposition, and they certainly should not have done so without protest, unless they were willing to confess that their Brotherhood was an evil thing. But nevertheless they may have made, and very likely have made, a great mistake in striking. Whatever our grievances, we should not go to war without a good prospect of success. A man may have justice on his side,

but he is foolish to take his case into court if he cannot prove his position and win his suit: otherwise he may be ruined by costs and lose what little he had without gaining what he was entitled to. In the case of the Reading, the chances of success in striking seem to us very poor, and the results of failure will doubtless be disastrous and perhaps deadly to the Brotherhood—at all events much more serious than if it had quietly dismissed its members who are in the service of the Reading, and thus avoided a conflict which may destroy it. But whatever may be the fate of the present Brotherhood, we may rest assured that it or some similar organization will continue to exist. It will not stay killed. Many readers will remember how thoroughly the old "Brotherhood of the Foot-board" was extinguished, only to be succeeded after a little by the present stronger but more politic organization.

Discriminating Rates.

The difference between through and local tariffs, and other differences in rates, cause complaint and discussion and legislation, or attempts at legislation, the world over, and not once for all, but time and again; and though sometimes the legislation and railroad administration of a country have aimed to prevent such differences, or at least to avoid differences in price where there were no differences in cost, still everywhere the railroad authorities have been forced, by the very nature of transportation business, to make discriminations, which periodically become the object of bitter attacks by a part of the community. In France, where no reductions any more than increases can be made in rates without the consent and approval of the administration, railroad companies and the Government have been forced to make what in Europe are called "differential rates" for a great variety of reasons. The latest excitement on the subject is in Austria, where the Parliament has under consideration legislation to prevent the evils complained of. There the Austrian grain-grower complains that the railroad carries the grain of Hungary, next east, to the Swiss or other Western market for less than it charges him; and on examination it appeared that grain was carried from Roumania, east of Hungary, for still less, and from Russia, east of Roumania, at a still lower rate; the fact being that the further east the grain grew, the more likely was it to go down the Danube to the Black Sea, and thence by sea to Western Europe; and if the railroads got the Eastern wheat to carry they had to carry it for a trifle above cost, and the further east they went for it, and so the further they carried it, the less they could get for it, for the cheaper became the water transportation.

The law introduced into the Austrian Parliament provides that on the same line under similar circumstances the charge shall not be greater for a shorter distance than for a longer one. For this the Railroad Committee of the House of Lords has proposed the following substitute: "On the same road and in the same direction and under similar circumstances, the total charges for transportation may not be greater for a nearer than for a more distant station. In import and export traffic, the total charge between a station on the border and an inland station on the same road under the same circumstances may not be greater than the total charge between the inland station and a foreign station beyond the station on the border. The above restrictions, however, do not apply to through traffic from one foreign country to another, to shipments from and to seaport stations, and finally to all cases when the reduction of the rate for the more distant station is compelled by the lower tariff of a competing route (railroad or vessel) connecting the same stations."

This committee opposes the original law in its report on grounds that have been stated and enlarged upon from time to time in almost every country; then apparently been forgotten long enough to give opportunity for another crusade against the "unjust discriminations;" then rediscovered and again urged. In France the Legislature went through the same course in Louis Philippe's time; we and others have gone over and over it during the years of the granger agitation in this country. At the late convention of the General Passenger and Ticket Agents' Association in St. Louis, Mr. Thomas L. Kimball, the General Ticket Agent of the Union Pacific Railroad, made a very interesting address on the relations of the railroads and the State, in which, on the subject of discriminating rates, he advanced almost precisely the same arguments that were made a week or two later by this committee of the Austrian Parliament. The argument is, indeed, one that needs restating periodically, for the principle on which discriminations (proper ones) rest is vital to the economical conduct of transportation business, and it is not obvious, but seems paradoxical, and the community, which has the right to know that it is not abused, is sure, whenever business is bad and all expenses are felt, to become indignant at discriminations which are inevitable, unless some one is ready to point out why they are inevitable. For this reason it seems to us that such a discussion as that of Mr. Kimball's address, made to a body of railroad officers, has real value. Railroad officers who know that they have to discriminate in this way and that in making rates are not always able to tell why they have to. But this ability to give reasons for their policy is not the least desirable of their qualifications. They represent, to the public, the corporation which takes their money, and they should endeavor not only to secure to the company its due profits, and at the same time deal justly with its patrons, but also to convince those patrons that they are justly dealt with.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Long Island.—The Brooklyn Central & Jamaica Branch was extended in Brooklyn westward along Atlantic avenue to Flat-

bush avenue, 1 mile, taking the place of a street railroad. *Spartanburg & Asheville.*—Track extended 5 miles to a point 10 miles northwest of Spartanburg, S. C. *Southern Pacific.*—Extended from Castle Rock, Cal., east by south 37 miles.

This is a total of 43 miles of new railroad.

Technical Conventions.

Annual conventions of railroad and engineering associations will be held as follows:

The American Society of Civil Engineers, at New Orleans, Tuesday, April 24.

The American Railway Master Mechanics' Association, at St. Louis, Tuesday, May 15.

The Master Car-Builders' Association, at Cleveland, Wednesday, June 13.

Mr. JOHN F. TRACY, whose resignation, following his failure to meet his engagements in some stock speculations in Wall street, occurred last week, is among the best known of Western railroad men, and has been active and successful, both as a manager and as a speculator, for many years. He has been a very wealthy man, but it is said that his failure last week is complete, and leaves him poor. Mr. Tracy has had a remarkable career as a railroad man. Experienced in the business, with a strong will and great decision of character, he paid great attention to the details of the management of his road, was strictly economical even in flush times, and tolerated no abuses by which any one could make money on the road at the expense of the stockholders. He knew too much about the business of the road to be deceived in such matters, and he knew, too, how much workmen were capable of, and would not tolerate the maintaining of fat, easy positions for the benefit of their occupants. His road has paid 10 and 8 per cent. dividends for many years, and has maintained this latter rate throughout the depression of the past four years. At the same time he was a great speculator in stocks, and speculated often in the stocks of his own company, which has perhaps on that account not enjoyed the full measure of confidence usually accorded to a company which has paid large dividends continuously for many years. Mr. Tracy has been suffering from illness for some years, and Mr. Riddle, the late Vice-President, who succeeds him, has had most of his duties to attend to recently. Mr. Tracy is now said to be very seriously ill, and many believe that but for this he would not have failed.

OCEAN FREIGHT DISCRIMINATIONS made by the steamer lines from Liverpool in favor of inland cities in this country and against New York have been made known recently and described as a "conspiracy against the business of New York." According to this statement, while the rates charged for "special class" goods, including metals, salt, glass, etc., were \$3.58 from Liverpool to New York, they were but \$1.24 to Boston, \$2.81 to Baltimore and Philadelphia, and \$3.19 to western cities, from Pittsburgh and Buffalo on the east to Chicago, Indianapolis and Louisville on the west. This gives for a shipment to Chicago only about 14¢ cents per 100 lbs. for the rail shipment and nothing at all for the water shipment. The railroad companies affirm that the steamers pay their full freight, whatever that may be at the time, and it is not probable that the above rates were made except when the railroads were cutting and carrying westward at lower than their regular rates; but it is none the less true that similar discriminations are likely to be made, and that when made they are likely to be against New York, for the very reason that by far the greater part of the imports tend to go to New York, the great market of the country, and that steamer lines to other ports where they get good cargoes to Liverpool cannot get back cargoes without offering rates lower than the New York rates. That is, the steamers in order to get any business aim to overcome the disadvantages of the market at Baltimore or Montreal by an advantage in the cost of ocean transportation. For this condition of things, no remedy is apparent. The sea is open, and legislation for "pro rata" rates will not apply.

THE MORRIS CANAL, which extends across New Jersey from the Delaware River at Phillipsburg to the Hudson at Jersey City, was at one time a very important line of transportation, and some of the locks and inclined planes by which the elevations on the line were overcome were considered in their day very considerable achievements of engineering. It was for many years one of the chief coal-carriers to a large section of country, and even to New York, and was the main outlet for the iron region of New Jersey, whose development was, indeed, largely due to the canal. It still carries a considerable traffic in coal, ore and lumber; but, although the business of the country it serves has greatly increased, by far the larger part of it is carried by the several lines of railroad which have been built parallel to the canal. It is no longer essential to the country which it serves, and there is now under serious discussion a plan for its purchase by the cities of Newark and Jersey City, and its use as an aqueduct for the purpose of carrying to those cities the water of Lake Hopatcong and the other mountain streams and lakes which feed its upper levels. The extent to which the railroads have replaced it as a line of transportation is shown by the fact that the only serious opposition to this plan comes, not from the people on the line of the canal, but from those of the two cities interested, who fear that to buy it and fit it for an aqueduct will require a greater expenditure than they are willing to incur at present.

THE MICHIGAN LEGISLATURE has had under consideration the petition discussed in the special report of Railroad Commissioner Cobb, part of which we published last week. The Senate Committee on Railroads recently made its report on the subject, which agrees with Mr. Cobb's in every particular, denying that the special railroad charters of the State can now be

unconditionally repealed, that the railroads charge enormous and unjust rates, that they combine to oppress the community, that uniform maximum rates are desirable, or that any Michigan companies make exorbitant profits. On the contrary they assert that "not one single railroad in the State of Michigan is at present making a reasonable return of interest on the actual, not nominal, capital invested." In consideration of these facts the committee say that they "most earnestly deprecate any legislation of the character prayed for in the petitions and memorials referred to them."

THE WHOLE CHICAGO & NORTHWESTERN DIRECTORY, nearly has been sued by one of its number, Mr. Harvey Kennedy, a broker, who claims that those against whom he brings suit were partners in the "pool" for buying Northwestern stock, which precipitated the failure of Mr. Tracy. Most of the defendants, however, deny that they had anything to do with the pool, and even those who were speculating for a rise deny that they had any interest in any stock not purchased in their own names. Meanwhile the speculation has been most disastrous. Northwestern common, which was 31½¢ April 10, fell the next day to 18½¢, has been as low as 15 since, and last Tuesday was 16½¢ to 17½¢. Rock Island, which stood at about 96, has been down to 86 and has now recovered to about 90. Bonds have suffered somewhat with the stock, and somebody must have lost a good deal of money.

THE SOCIETY OF CIVIL ENGINEERS has recently received from Mrs. Charles Collins a large album of photographs of the bridges on the line of the Lake Shore & Michigan Southern Railway. This album was prepared before the death of her husband for the purpose of presenting it to that Society, but the purpose was not consummated by him at the time of his death.

LONG RUNS have made it possible to do the following work on the Hudson River Division of the New York Central & Hudson River Railroad: Recently twenty trains were run from Albany to New York and nineteen from New York to Albany, a distance of 146 miles, within twenty-four hours, with twenty-five engines. Thirty-six crews of men were employed in doing the work. The locomotives, exclusive of switching, on the same road last month ran on an average of 5,379 miles each.

THE TRUNK LINE COMPACT seems to have been favorably received, and there seems to be general confidence that it will be kept for this season at least. President Garrett, of the Baltimore & Ohio, has publicly stated his determination "to carry out every point of the agreement with absolute thoroughness." There is now a fair amount of traffic, and notwithstanding the near approach of the opening of navigation, there is no difficulty in getting the rates asked.

General Railroad News.

PERSONAL.

—Mr. Frederick Reed, Train Master of the Chicago, Rock Island & Pacific road, died at his residence in Chicago, April 2. He had been connected with the road for nearly 20 years, 15 years in his last position.

—Mr. Wm. P. Lee, Roadmaster of the St. Louis Division of the Wabash road, shot himself at Litchfield, Ill., April 3, and lived but a few hours. He was 45 years old and leaves a family. The cause of his suicide is not known.

—Mr. John B. Price, for many years connected with the Chesapeake & Delaware Canal, and its Superintendent for 27 years, died recently at his residence in Chesapeake City, Md. He was 68 years old.

—Mr. J. H. Wyeth, formerly Purchasing Agent of the Missouri Pacific Railroad, has recently taken the Western agency of the Union Car Spring Manufacturing Co. and Farist Steel Co., with headquarters at St. Louis.

—Mr. W. H. Dulany, of Louisville, Ky., has resigned his position as President of the Cumberland & Ohio Railroad Company, after several years' service.

—Mr. John Thompson resigned his position as Master Mechanic of the Eastern Railroad April 1. He had been connected with the road for 27 years and Master Mechanic 21 years; some years ago he was offered the position of Superintendent, but declined it. He has had the entire charge of the large equipment of the Eastern road, and has made for himself an excellent reputation as a capable and efficient officer. Mr. Thompson is an esteemed member of the Master Mechanics' Association.

—Mr. Thomas N. Haskett, for 25 years Superintendent of Bridges of the Baltimore & Ohio Railroad, has resigned that position. Mr. Haskett retires from active business, and will reside at Sandy Hook, Washington County, Md.

—Mr. John F. Tracy has resigned his position as President of the Chicago, Rock Island & Pacific Company, on account of ill health.

—Mr. Edward Hiley, Auditor of the Lake Superior and Mississippi road, died recently of pneumonia at St. Paul, Minn.

—Col. T. H. Carter, the new Railroad Commissioner of Virginia, is a large land owner and farmer of King William County. He is said to be an active, energetic and popular man, but his chief experience with railroads has been as a traveler and shipper of produce over them.

—Mr. H. J. de Mares Oyens, representative of the Dutch, and Captain Garnett of the English stock and bondholders, have been making an examination of the Illinois Central and its tributary lines. They are also commissioned to examine and report on the Toledo, Peoria & Warsaw road.

—Mr. N. F. Ellsworth, Superintendent of the Woodruff Sleeping Car lines, was married to Miss Fanny Cornell at Louisville, Ky., recently. Naturally, the wedding trip was taken in a Woodruff palace car.

—Mr. W. G. Ulery, who was widely known among railroad men as the traveling agent of Nathan & Dreyfus, of New York, died Feb. 1 at San Bernardino, Cal.

—Mr. H. A. Blood, formerly manager of the Boston, Clinton & Fitchburg road, is now in very embarrassed circumstances, so that even his household furniture has been attached for debt. Mr. Blood was largely engaged in manufacturing as well as in railroad enterprises, was Mayor of Fitchburg two years, and was at one time considered a wealthy man. He is said to have lost a great deal of money in his road, and has also been unfortunate in some of his manufacturing ventures.

—The Albany Journal reports that a deficit of some \$4,000 has been found in the accounts of Mr. James Loughren, for a long time past in the service of the Delaware & Hudson Canal Company as Cashier of the Albany & Susquehanna Division.

It states also that a small defalcation has been charged to S. W. Craver, late Freight Agent. The books are now being carefully examined.

Mr. Chauncey W. Gardner, Superintendent of the Susquehanna Division of the Erie Railway, is in such feeble health as to be at present unable to attend to his duties.

THE SCRAP HEAP.

Railroad Manufactures.

The contract for the superstructure of the bridge over the Tennessee River, near Chattanooga, on the Cincinnati Southern road, has been awarded to the Louisville Bridge & Iron Co., of Louisville, Ky. The bridge will be all of wrought iron and 1,804 feet long, having a channel span of 260 feet, a drawspan of 264 feet and six other spans of 210 feet each. The work is to be done by Jan. 1, 1878. The work was at first awarded to Clark, Reeves & Co., but they refused to sign the contract.

The National Locomotive Works of W. H. Baily & Co., at Connellsville, Pa., have recently shipped narrow-gauge engines to the Tyler Tap Railroad in Texas and to the Seattle & Walla Walla road in Washington Territory, and a standard-gauge engine to the Kansas City, Burlington & Santa Fe road. They have orders for several engines on hand and an encouraging prospect for the season.

The Rogers Locomotive Works, at Paterson, N. J., are building two locomotives to go to New Zealand and two for a Western road, and have some repair work also.

Mr. J. D. Hutchinson, Vice-President of the Cincinnati Bridge Co., has established an eastern office at No. 110 Broadway, New York. Mr. W. J. Morris has been appointed Engineer with office as above, in New York.

Messrs. Hoopes & Townsend, of Philadelphia, received a Centennial award for their exhibit of bolts and nuts, the judges giving their reasons for the award as follows: "Being of excellent workmanship and quality of material. First-class in all particulars."

The Fairbanks Scale Co., of St. Johnsbury, Vt., has just filled a large order, including several railroad scales, to go to Moscow, Russia.

The Pennsylvania Railroad shops at Altoona are now running 10 hours per day. In the last three months more metal has been used in the foundry than in any corresponding period previously, nearly 500 tons having been melted.

A ten-inch bar mill is to be put up in the old iron rail mill of the Joliet (Ill.) Iron & Steel Co.

The Ohio Falls Car Works, at Jeffersonville, Ind., are busy on wheel and foundry work, are building several passenger cars and repairing a number of freight cars.

A number of box cars belonging to the Western Car Co. of Indianapolis and now leased to the Hoosier Tunnel Line have recently been repaired and painted at the Chicago, Burlington & Quincy shops in Aurora, Ill.

The Lehigh Valley Railroad Co. is buying large quantities of car stock, chiefly oak, at Laurelton, Pa., and vicinity.

The Lochiel Iron Works, at Harrisburg, Pa., are closed.

The Roane Iron Works, at Chattanooga, Tenn., are said to be preparing to put up works for the manufacture of steel rails.

The Lackawanna Iron & Steel Co. is running its works at Scranton, Pa., to their full capacity in the steel department.

The Cleveland (O.) Rolling Mill Co. is running its rod, bar and plate mills to their full capacity. Work in the rail mill has been delayed by a strike, which, however, is now settled.

The Albany & Rensselaer Steel & Iron Co. is running most of its works and expects to start up the rail mill at Troy, N. Y., in a short time.

The Springfield (Ill.) Iron Co. has had some trouble with its men, the yearly contracts having recently expired. A few of the men left and all quit work, but the matter was satisfactorily settled after a few days' stoppage.

The stockholders of the Wyandotte (Mich.) Rolling Mill Co. have elected H. C. Hodges President and W. N. Carpenter Vice-President. The iron rail mill is now running after a stoppage of several months.

The stockholders of the Allentown (Pa.) Rolling Mill Co. are considering the question of putting up the necessary plant for making steel rails.

McKee & Fuller's Lehigh Car Wheel Works at Ferndale, Pa., are running on wheels for the New York & Manhattan Beach, the Royal Land Co.'s road, the Denver & Rio Grande and on an English order.

J. G. Brill & Co., of Philadelphia, are building, besides horse-cars, 20 open excursion cars for the Prospect Park & Coney Island, and eight for the New York & Manhattan Beach road.

The Carthage Iron Co., of Carthage, N. Y., is now making wheels for steam and street cars. The iron used is made from ore from the Shurtleff ore bed in Jefferson County, N. Y.

The Toronto Car Co., at Toronto, Ont., is building a number of cars for the Victoria Railway.

The Cobourg (Ont.) Car Works are building 200 box cars for the Intercolonial Railway and a number for the St. Francis & Megantic road.

The Danforth Locomotive & Machine Works, of Paterson, N. J., are repairing and rebuilding the large iron tanks at the Westhewen oil docks, opposite New York, which were partly destroyed by fire some time ago.

The Chicago agent of the Crescent and National Car Spring companies sold 135 tons of steel coiled springs in one order last week.

A Great Blast.

Preparations have been completed for an extensive blast which was to be made at the Port Henry Iron Ore Company's Mine 21, near Mineville, Essex County, N. Y. This Mine 21 is on a vein of magnetic iron ore of extraordinary size; it was begun by an open cutting, but followed the dip of the vein, which led it under the surface rock and earth for some distance. To support the roof several large pillars of ore, varying from 50 to 170 feet in height were left and the company lately resolved to remove them in order to secure the great body of ore contained in them and to make accessible the ore which lies beneath them, numerous borings having shown that there is still about 130 feet of the vein before barren rock will be reached. To this end the roof of rock and earth over the pillars has been removed and the pillars have been pierced with numerous holes, the longest 110 feet deep and varying from that depth to a few feet. These holes have been charged with explosive cartridges, which are to be set off by electricity. The wires are nearly all in position, and a very powerful battery is provided to supply the necessary current. The explosive used is known as vigonite and is manufactured on the spot by the Miners' Powder Company. The pillars are estimated to contain about 80,000 tons of ore and the blast is expected to break them up and throw them down so as to make this great body of ore accessible to the miners, who will further break up the fragments and hoist them out of the mine. A large number of engineers have been invited to witness the blast, and an excursion train from New York has been provided by the company. The mines are reached by the Lake Champlain and Moriah Railroad, which connects them with the New York & Canada road and the navigable waters of Lake Champlain.

Consolidation of Railroad Guides.

The National Railway Publication Company announces that, as it has "purchased the railway guide and hand-book heretofore published by Messrs. Rand, McNally & Co., of Chicago, the necessity for the issue of the pocket edition of the Traveler's Official Guide 'Official Time Tables' no longer exists, and

its publication will therefore be discontinued with the present number. This book has been consolidated with 'Rand, McNally & Co.'s Railway Guide and Hand-Book,' and the combined publications will hereafter be issued, commencing with the May number, by the National Railway Publication Company, in Chicago, as the 'Rand-McNally Railway Guide and Hand-Book,' with Messrs. Rand, McNally & Co. as General Agents, Western Department at Nos. 77 and 79 Madison street, Chicago, Ill.

"Communications upon business of the 'Travelers' Official Guide' should be addressed, as heretofore, to the office of the company, No. 238 South Fifth street, Philadelphia, Pa., and upon business of the 'Rand-McNally Railway Guide and Hand-Book' to the office of the General Agents of the Western Department, as above stated."

Proposals for Iron Beams.

Major D. W. Flagler, United States Ordnance Corps, will receive until May 2, at the Rock Island Arsenal, Illinois, proposals for 105,000 lbs. of 15-inch wrought-iron I beams, 200 lbs. per yard; about 203,000 lbs. of 12 or 12½-inch wrought-iron I beams, 125 lbs. per yard, and 300 wrought-iron angle-pieces, 3½ in. by 3½ in. by 3½ in. The beams must be straight, out of wind, cut square at the ends, free from flaws, blisters and ragged edges and contain good iron. The name of the manufacturer must be stated in the bids. Nearly all the beams will be required in lengths of from 18 to 20 feet, and about two-thirds of them in such exact lengths that they must be cut cold. The beams are to be furnished delivered on cars at the Arsenal. The successful bidder will be required to deliver the beams within 60 days after entering into the contract.

The Leighton Sleeping Car.

A new pattern of sleeping car has been invented by Messrs. James T. and D. R. Leighton, of New Haven, Conn., and several of the cars are now being built by the New Haven Car Co. for the Wagner Sleeping Car Co. They are thus described by the *Buffalo Commercial*: "The Wagner and Pullman sleeping cars weigh now from 24 to 34 tons. The great dead weight is required on account of the heavy work for the upper berths. The upper portion of the car is necessarily very heavy and strong; this weight, added to that of the berths, makes an excessive load in dead weight. It also tends to make a car rather unsafe by loading the upper portion so much, and renders the strain, under lateral motion, very great and expensive in repairs. The patent which Senator Wagner has now adopted as best meeting the requirement does away with the heavy construction of upper works and additional necessary weight. The completed coaches after this will turn the scales at 19 tons or a trifle less. The machinery for upper berths is very simple, portable and light. It is all stowed under the seats or sides of the cars. When the sleeper is made up for the day it presents about the exact appearance of an ordinary drawing-room coach. When it is made up for the night it resembles in essentials the present sleeper, and has the same capacity for passengers and every other accommodation. But it has six or eight tons less dead weight, does not wear the track so severely as the heavy cars, is less liable to upset, the weight being stowed low down near the track. This kind of car is now in use on some Southern railroads, and its performance is quite satisfactory."

A Steam Sled.

Mr. George H. Christian, of St. Paul, Minn., has invented and constructed a steam sled, which is thus described by the *St. Paul Pioneer-Press*:

"Beginning at the ground, it rests upon a pair of huge bob-sleds, 4 feet in width, each 5½ feet long, the runners having a face of 6 inches. Upon these sleds rests a platform 7 feet 8 inches wide and 26 feet long. This platform carries the complete outfit of a road engine—boiler, steam pump, water tanks, wood rack, etc. It is an upright boiler, and a 16 x 24 in. cylinder imparts power to the working machinery by direct action from the piston rod upon two perpendicular levers or walking beams, one of which hangs on a fulcrum block, and regulates the length of stroke or step of the feet which propel the machine. There are eight of these feet, four upon either side, and the number can be increased to twelve if desired. The legs are wrought iron, three feet long, with a cast-iron foot provided with corks similar to the corks of a horse-shoe. These instruments weigh about 100 pounds each, and by the machinery are planted upon the ground somewhat in imitation of a walking movement, and are relied upon to push or drag the machine over the road. The motion can be reversed also, in case it is desirable to back the machine."

"The weight of this steam sled as it stands is about twelve tons. It is designed for winter use solely, and is estimated to travel over level roads at the rate of two miles per hour, drawing a load of 90 tons."

It is especially designed for the use of lumbermen.

A Bullet Proof Car.

The *Baltimore Sun* says: "There has just been completed at the car shops at York, Pa., the first bullet-proof car ever manufactured in the United States. The car is 31 feet long, 8 feet high and furnished with all the latest improvements in ventilation, etc. The body below the windows is covered with ½ inch iron and the panels between the windows and the body above them are covered with ¾ inch steel. The windows can be closed with steel slides, and when they are down the entire car is bullet-proof. The interior is richly ornamented, and in appearance inside and out resembles a first-class passenger coach. It weighs about 6,500 pounds, and was ordered by the Spanish government for use in Cuba."

This may be the first bullet-proof passenger coach, but it is certainly not the first bullet-proof car ever built in the United States. The writer assisted in 1862 in building a bullet-proof car which was used for some time on the Atlantic & North Carolina Railroad, then run by the United States military forces. The car was made by putting up a stout frame on an ordinary flat car and boarding it over, the planking being covered with boiler plate on the sides and old rails on the ends, which were inclined. The car was armed with a small brass howitzer and had a number of loop-holes for musketry. It was shown to be bullet and even shot proof by actual demonstration on several occasions.

A Big Car.

The *Burlington Hawkeye* says: "Emigrants and others traveling to Nebraska by teams will be interested to know that a good, substantial car, one hundred feet in length, nine feet wide and ten feet high, in now running daily over the Missouri River railroad bridge between Council Bluffs and Omaha, for the purpose of carrying teams and wagons over the Missouri River at that point. Horses can be driven into this car at the end, without un hitching from the wagon, as readily as they can be driven over a covered bridge or into a barn. The car leaves Council Bluffs every hour in the day, from eight a. m. until six p. m., excepting twelve o'clock noon. The teams are carried over the river and the bottoms, a distance of nearly three miles, in perfect safety, and in only fifteen minutes' time."

Success of Steam Street Cars (?).

The *Philadelphia Times* of a recent date says: "The week's trial of the dummies on Market street has resulted favorably. A comparison of the receipts of the steam and horse cars shows a balance in favor of the former. Five of the best paying horse cars averaged \$65 in cash receipts, while the five dummies averaged over \$100 in cash receipts, the fare being five cents. The cost of running a horse car one week—not including care of the horses in stable, shoeing or wear and tear

of harness—is \$62.86, while the cost of running a steam car for the same period is \$54.80, making a saving in favor of the steam cars of over \$8.96, to say nothing of the extra comfort to passengers."

We are afraid the above statement does not include all the items of expense of either the horses or steam engines. There is no charge for interest or deterioration of either.

A New Kind of Boiler Explosion.

The *Eureka* (Nev.) *Sentinel* of recent date says: "A singular accident happened yesterday to Johnny Bell, engineer of No. 4 on the narrow-gauge. It is the custom to keep a tin pot of warm coffee on the engine, sitting over the fire-box, for the benefit of the engineer and fireman, during their long rides, and as an antidote against sleepiness. Mr. Bell was standing in the cab when the coffee-pot exploded with a loud report, throwing the boiling liquid on his face and neck, and scalding him so seriously that another engineer had to take his place on the down trip. We had heretofore classed these useful articles of domestic economy among the non-explosive, but in view of this accident they will have to take their position in the category of kerosene lamps, steam boilers and powder magazines."

OLD AND NEW ROADS.

Cincinnati, Sandusky & Cleveland.

The application of the company to vacate the order appointing the Receiver came up before the Circuit Court in Toledo, O., April 16. A large amount of testimony was offered and several lawyers were to be heard on each side, and a decision was not expected before the end of the week.

Royal Land Company.

This company agrees to extend its narrow-gauge road from Fredericksburg, Va., southeast down the Northern Neck (the peninsula between the Potomac and Rappahannock rivers) to Wicomico, about 70 miles, provided the people on the line will give right of way and depot grounds and \$150,000 in cash, the money not to be payable until the road is finished. The road will pass through five counties, and it is proposed to vote a subsidy of \$30,000 in each.

Baltimore & Cumberland Valley.

This company has been organized under the general laws of Maryland and Pennsylvania to build a railroad 21 miles long from Chambersburg, Pa., south by east to the Western Maryland at a point 2½ miles east of Smithsburg, Md., and 72 miles from Baltimore. The line has been surveyed and a careful estimate puts its costs at not more than \$250,000. It is proposed to build it as a branch of the Western Maryland and to leave it to that company when completed. Subscriptions are now being solicited along the line and also in Baltimore, where it is urged that the new road will bring to that city a large share of the trade of the Cumberland Valley.

Columbus, Washington & Maysville.

There is a revival of interest in this project and a number of meetings in aid of its construction have been held along the line. It is now proposed to make it a narrow-gauge road. The projected line is from Columbus, O., south by west through Washington, Hillsboro and Ripley to the Ohio River opposite Maysville, Ky., about 110 miles.

Cincinnati, Hillsboro & Jackson.

This company was recently organized in Ohio for the purpose of building a line from Hillsboro, O., southward about 15 miles to Jackson and Sardinia.

Chicago, Rock Island & Pacific.

An attack was made on the stock of this company in Wall street last week which resulted in carrying it down from about par to 86. A further result was the resignation of President Tracy, the cause stated being his failing health.

Only about \$1,500,000 of the new 6 per cent. loan was found to be applied for when the bids were opened, April 14. The amount offered was \$8,000,000. The attack on the stock doubtless had something to do with the small amount of bids.

At a meeting of the board held April 16, it was ordered that the 40,200 shares of stock owned by the company be transferred to the Vice-President and Treasurer, to be held by them as trustees until authority can be had to reduce the capital stock from \$25,000,000 to \$21,000,000. It was ordered that subscriptions for the new 6 per cent. bonds be received payable in cash until April 25; after that date no cash subscriptions will be taken, but old bonds will be received in exchange for the new.

Dividends.

Dividends have been declared as follows:

Panama, 3 per cent., quarterly, payable May 2.
Peterboro (leased to Nashua & Lowell) 3 per cent., semi-annual, payable April 16.
Baltimore & Ohio, 5 per cent., semi-annual, payable May 15.

Meetings.

Meetings will be held as follows:

Houston & Texas Central, annual meeting, at the office in Houston, Tex., May 7.
Vermont & Canada, annual meeting, at Bellows Falls, Vt., April 25, at noon.
Northern Pacific, special meeting, at the office, No. 23 Fifth avenue, New York, May 9, at 11 a. m.
Pittsburgh, Fort Wayne & Chicago, annual meeting, at the office in Pittsburgh, May 16, at noon.
Kansas Pacific, annual meeting, at the office in Lawrence, Kan., May 3, at 1 p. m.

St. Louis, Iron Mountain & Southern.

In the United States Circuit Court at St. Louis, April 2, the Union Trust Company, of New York, Trustee under the consolidated mortgage, filed a petition asking to be appointed Receiver and to be put in possession of the road. The petition sets forth that the company has failed to pay the coupons due April 1, and that the Trustee had demanded possession of the road according to the terms of the mortgages, which possession the company refused to give.

On April 6 counsel for S. G. & G. C. Ward, Agents for the Barings, applied to the United States Circuit Court for an injunction to restrain the company from placing 45,000 shares of unissued stock in the hands of Rufus J. Lockland as security for payment of the floating debt. The bill alleges that the proposed transfer of the stock is for no consideration; that it is believed that the floating debt will not be paid at maturity, and that the object of the arrangement is to secure the eventual transfer of the stock to Messrs. Allen and Marquand, to secure their control of the road.

St. Paul & Rochester.

At a large meeting held in St. Paul, Minn., last week, resolutions were passed in favor of a subscription of \$500,000 in aid of this road, and delegates were appointed to attend a convention which was to be held in Rochester, April 18. The projected line is from St. Paul south by east to Rochester, about 75 miles, with a possible future extension of 40 miles further to the Iowa line.

Great Western, of Canada.

Notice is given that the semi-annual meeting, to be held in London, England, April 27, will be made a special meeting for the "submission for approval, by the shareholders, of arrangements with the Detroit & Milwaukee Railroad Company, its bondholders and the company to be formed upon its reorganiza-

zation, for leasing and working the Detroit & Milwaukee Railway, and purchase of shares and guarantee of bonds of the reorganized company proposed to be entered into pursuant to the shareholders' resolution of the 30th of April, 1875; and for approval of a proposed purchase of the capital stock of the Brantford, Norfolk & Port Burwell Railway Company, and guarantee of interest on a portion of its bonds. And to authorize the necessary agreements to carry such arrangements into effect."

Hannibal & Naples.

Holders of first-mortgage bonds are requested to deposit them with the trustee, Mr. A. B. Baylis, at No. 44 Exchange place, New York, to be used by the committee in the purchase of the road at the coming foreclosure sale.

Cincinnati Southern.

Mr. Julius Dexter, of Cincinnati, gives notice to the trustees that he will take legal measures, by injunction or otherwise, to prevent them from operating the completed portion of the road or leasing equipment for that purpose, as he believes that the law authorizing such action is void. The trustees in reply say that, although they believe their power to be full and sufficient in the case, they have no present intention of leasing equipment. In any event they will give full notice of any action they may take in the case.

Denver & Rio Grande.

This company's report for January is as follows, the statement this year including the Trinidad Extension and the Canon City and La Veta branches as well as the Main Line, making 269 miles in all:

Freight.....	\$29,695 48
Passenger, mail and express.....	12,086 78
Miscellaneous.....	75 00

Total (\$156 per mile).....	\$41,858 26
Expenses (60.33 per cent.).....	25,256 17

Net earnings (\$62 per mile).....\$16,602 09

Mails, troops and Government freight transportation amounted to \$2,407.74 of the gross earnings.

The grading of the extension of the La Veta Branch to Fort Garland is completed and a contract has been made for the rails. It is expected that tracklaying will be begun in May and that trains will run to Fort Garland in June.

It is said that an agreement has been made with the employees as to their back pay, the company agreeing to pay up all arrears to within four months by May 1, and the employees allowing four months' arrears to remain for a time on condition of receiving one month's pay hereafter in each month until business improves.

Atlanta & Richmond Air Line.

This road, it will be remembered, was sold under foreclosure in Atlanta, Ga., Dec. 5, 1876, and purchased for the first-mortgage bondholders. The sale included the road from Atlanta, Ga., northeast to Charlotte, N. C., 266 miles, and all the property of the company. The purchasers have, under the laws of the several States of Georgia, South Carolina and North Carolina, formed themselves into three corporations, to be consolidated, and known hereafter as the Atlanta & Charlotte Air Line Railway Company. John H. Fisher, Receiver of the Atlanta & Richmond Air Line, delivered possession to the officers of the new organization on April 16, when they entered at once upon the management of the new company.

The directors of the new company are chiefly residents of New York and the general and transfer office will be in the Coal and Iron Exchange Building, in Courtlandt street in that city. The immediate management of the road will be in the hands of General Manager G. I. Force, who is well known as having been for a long time in charge of the Macon & Western, and more lately of the Virginia Midland road.

Syracuse, Geneva & Corning.

The contract for the tracklaying and ballasting of this road has been let to John Hunter & Co., of Sterling, N. Y.

Jacksonville, Pensacola & Mobile.

The time for the sale of this road has been again changed, and is now fixed for July 2, at Tallahassee, Fla.

Columbus & Hooking Valley.

At the annual meeting in Columbus, O., April 10, the stockholders voted to ratify the contract with the Columbus & Toledo Company for joint use of the depot and yards at Columbus, for the exchange of traffic and the management of the two roads by the same officers.

Alabama & Chattanooga.

Mr. J. C. Stanton gives the Chattanooga (Tenn.) Times the following statement concerning the status of this road: "Some time ago the road was sold in conformity with a decree of the court, and D. C. McMillin and J. T. Wilder became the purchasers for creditors, paying \$30,000 down, and on the last day of March, which was at the expiration of the forty days' time granted by the court, \$50,000 more was paid, completing the contract that far. This gave the Stanton party virtually possession of the road. Meantime, Stanton had an agreement with John Swan, who represented the first-mortgage bondholders, on terms of sale. Mr. Swan paid back the \$80,000, but has failed to comply with the other portions of the contract. Had he done so, or even now if he should do so, the property would be turned over to the parties represented by Swan. This contract protects every court creditor, whether the claim be large or small. If it should not be complied with then, the creditors will get the property free of incumbrance by the payment of the \$1,300,000, all of which, except the cash part already paid in of \$80,000, may be paid in claims."

The General Time Convention.

The usual spring convention of superintendents and general passenger agents to arrange the summer time tables was held in Cleveland, O., April 11, with a full representation of the through lines. Mr. E. S. Flint, of the Cleveland, Columbus, Cincinnati & Indianapolis, presided, Mr. W. F. Allen, of the Official Guide, acting as Secretary. A committee was appointed to prepare a schedule and subsequently reported one substantially the same as that of last summer, which was adopted. After the routine business was dispatched, resolutions of respect for the late Mr. D. M. Boyd, Jr., were adopted and the convention adjourned. The fall meeting will be held at the Windsor Hotel, New York, Oct. 11.

Atchison, Topeka & Santa Fe.

This company is now running a fast express train from Atchison and Kansas City to Pueblo, making close connection there with the Denver & Rio Grande for Colorado Springs and Denver. This train leaves Atchison 11.45 and Kansas City at 11.30 a. m., arriving at Pueblo 3 p. m., and Denver 8.30 p. m. on the next day; corresponding east-bound train leaves Denver 7 a. m., and Pueblo 2 p. m., reaching Atchison at 3.50 and Kansas City 4.25 p. m. of the next day. No emigrant or land excursion travel is carried on this train. The distance from Kansas City to Pueblo is 634 miles; to Denver 754 miles.

Ellsworth, Parsons & Memphis.

This is a pretty extensive project, including a line from Ellsworth, Kan., on the Kansas Pacific, south and east to Parsons on the Missouri, Kansas & Texas, about 200 miles, and thence east by south through Southern Missouri and Northern Arkansas to the Mississippi opposite Memphis, Tenn., about 330 miles further. It is said that the right of way from Ellsworth to Parsons is secured, and agents are now looking after right of

way and subscriptions in Arkansas. It is claimed that the road will connect the coal fields of Kansas with the Arkansas pine woods. Some conditional contracts have been made. The project has been talked about for several years, chiefly by expectant contractors.

Portsmouth, Ironton & Huntington.

This company has been organized to build a railroad from Portsmouth, O., southeast to a point on the Ohio opposite Huntington, W. Va., about 40 miles. The capital stock is to be \$500,000.

Central of New Jersey.

It is said that Receiver Lathrop has concluded an amicable settlement with the Lehigh Coal & Navigation Company, but the terms are not made public. At any rate the Navigation Company has not pressed its demand for the surrender of the Lehigh & Susquehanna road.

Iowa Falls, Belmond & Minnesota.

A company by this name has been organized in Iowa and is now having surveys made for a railroad from Iowa Falls north by west to Belmond in Wright County, a distance of 28 miles.

Southern Pacific.

At latest accounts the end of the track was at a point 217 miles east by south from Los Angeles, Cal., and only 28 miles from the Colorado River. This is 37 miles beyond Castle Rock, the last point noted. The main party of graders is within 22 miles of the Colorado, and an advance party is at work on the Mesa, three miles from the river. The track is expected to reach the river this month.

The report is renewed that, when the Yuma line is completed, work will be begun on a branch from Newhall station west about 50 miles to San Buenaventura, to be extended eventually to Santa Barbara.

Norwich & Worcester.

This company invites bids for \$400,000 new 6 per cent. bonds, having 20 years to run, the bonds being part of an issue of \$500,000 lately authorized by the stockholders. Bids may be sent until April 30 to G. L. Perkins, Treasurer, Norwich, Conn., or to Jacob H. Loud, Actuary of the New England Trust Company, at Worcester, Mass. Of the proceeds of the bonds \$150,000 will be used to pay off the old bonds maturing July 1, 1877, and the balance to pay for the viaduct at Worcester and other permanent improvements. Including the new issue, the company's funded debt will be \$895,000 on 66 miles of road.

Allegheny Valley.

It is said that this company is considering the question of building an extension of the Sligo Branch from Sligo, Pa., north by west to Oil City, about 30 miles. This extension would complete a loop line from Led Bank to Oil City, 46 miles long, or 22 miles less than the existing line. The extension would also pass through the centre of the Clarion oil field.

Ottumwa & Northern.

A company has been organized to build a railroad from Ottumwa, Ia., northward to Muckichinock in Mahaska County, about 25 miles.

Massillon & Ooshooton.

Surveys are being made for an extension of the line of this projected road from Beach City, O., on the Cleveland, Tuscarawas Valley & Wheeling, northeast to Canton, about 15 miles.

Lake Mills & Watertown.

It is proposed to build a railroad from Lake Mills, in Jefferson County, Wis., northeast to Watertown, about 13 miles. It is said that it can be very cheaply built.

Wheeling & Lake Erie.

Mr. H. B. Willson, who has taken the contract for completing this road, proposes to work on a new plan. Instead of grading the line first and then raising money to buy iron, he intends to use the cash subscriptions to buy the rails and then use them as a basis of credit to procure the means for the grading and ties. Mr. Willson does not intend to sell any of the bonds until a considerable section is completed, but he will issue 7 per cent. scrip having two years only to run, and he expects to dispose of enough of this along the line to complete 50 or 100 miles. He is to receive \$20,000 per mile, of which \$5,000 is payable in cash, \$7,000 in stock and \$10,000 in bonds, and all the stock and bonds issued will be deposited in trust as security for payment of the two years' scrip. Mr. Willson has already made contracts for iron and expects to have some 10 miles of road, from the Lake Erie terminus at Huron, O., to Norwalk, in operation by July. A good deal of grading has already been done under former contracts.

Hoosac Tunnel Line.

Two reports have been presented to the Massachusetts Legislature on the petition of Shanly Brothers, the contractors who finished the Hoosac Tunnel, for additional compensation. The majority report recommends that they be allowed \$125,000, on the ground that they lost money by their contract; that the contract was faithfully performed, and that the losses resulted from changes made, and from other circumstances unforeseen at the time the contract was taken. The minority report recommends simply that they "have leave to withdraw" their petition. The general sentiment is said to be in favor of some allowance for extra work, but there will be opposition to it.

A committee of the Massachusetts Legislature has been making an examination of the Western connection of the tunnel line proposed by Mr. Burt and his Boston, Hoosac Tunnel & Western Company. Mr. Burt's plan is to leave the Troy & Boston at Eagle Bridge, N. Y., build seven miles of road to Mechanicville and use the Rensselaer & Saratoga track, with a short cut-off line of four miles, to Schenectady, where connection can be made with the Albany & Susquehanna for Birmingham, the Erie road and the Pennsylvania coal region. From Schenectady about 100 miles of road are to be built to a connection with the New York & Oswego Midland, whose track will be used to Oswego, where there are western connections both by lake and by the Rome, Watertown & Ogdensburg's Lake Ontario Division.

It is said that the committee cannot reach any agreement, and that two or possibly three reports on the tunnel question will be presented to the Legislature.

Philadelphia & Reading.

The plan submitted by this company to its employees provides that the company shall contribute \$15,000 to a life insurance fund. To this fund engineers shall contribute \$2 each monthly, conductors and firemen \$1.25, and brakemen \$1. In case of death there shall be paid to the widow, children, parents or other heirs \$3,000 for each contributor of \$2 monthly; \$1,000 for those paying \$1.25, and \$700 for those paying \$1. Should any contributor to the fund be discharged by the company, he will cease to participate in the benefits of the fund, but the entire amount paid by him will be refunded. Should any leave the company's service voluntarily they will also cease to have any claim on the fund, but none of the money paid will be returned.

To the accident insurance fund the company will contribute \$10,000, and the contributions of the employees to be \$1, \$0.75 and \$0.50 respectively. In case of accident or injury such as to disable any contributor to the fund, those who pay \$1 monthly will receive \$12 per week while disabled; those who pay 75 cents, \$9 per week; and those who pay 50 cents, \$6 per week. The fund will be in the charge of three trustees, the President of the company being one and appointing the other two. These trustees are to make a full and clear public state-

ment annually of all receipts and payments and of the condition of the fund. The company will bear all the clerical and incidental expenses and the monthly payments will be deducted from each man's dues on the monthly pay-rolls.

The company at the same time submitted a similar plan for other classes of its employees.

This plan was discussed by a committee of the engineers and General Manager Wooten and was objected to as resting entirely on the credit of the company, which the committee did not consider as good security as that given by the Brotherhood.

After long consideration and after a number of Brotherhood men had been discharged from the Germantown and other branches, the engineers finally resolved to strike. The strike began at midnight on April 14, but no trains were left on the road, the men going through to their destination before leaving their engines. Most of the firemen joined in the strike, although the company promised them increased pay to continue work.

At latest accounts the company had new men enough to run all its passenger trains, but coal and freight traffic was much delayed, and some of the new men had left, being persuaded by the strikers to do so. General Manager Wooten on April 17 applied to the Governor for commissions for some special officers to protect the company's property, but no violence or interference with the road has been anywhere reported. The officers of the road state that they have no trouble in getting men to run the engines, but the strikers say that many of them are not competent or do not understand the peculiar construction of the engines in use on the road, and that a number of engines have been damaged. It is reported that the Brotherhood agrees to pay \$60 a month to engineers who leave the company.

Connecticut Western.

At a special meeting held in Hartford, Conn., April 17, the stockholders voted to accept the amendment to the charter passed recently by the Legislature, which authorizes the carrying out of the proposed agreement with the bondholders. This provides for the issue of preferred stock in exchange for the bonds, giving the bondholders control of the property, subject only to the right of the common stockholders to buy the preferred stock at par any time within 35 years.

Omaha & Republican Valley.

A contract has been let for the grading of a section of 10 miles from Wahoo, Neb., work to be begun at once. The road is to be completed to David City, in Butler County, by July 1.

Rochester & State Line.

Work on this road is again suspended, apparently in consequence of a struggle between several parties for the control of the road. Contractor Taylor is said to be very anxious to go on with the work, and, unless it can be resumed very soon, he will hardly be able to complete it by the contract time, July 1.

There is much excitement in Rochester over charges of corruption in the present contract. This contract required that \$600,000 bonds held by the City of Rochester should be exchanged for stock, and it is alleged that \$10,000 in bonds were offered to certain members of the City Council to induce them to vote for the exchange. These charges are to be investigated by the courts.

General Passenger and Ticket Agents' Association of Michigan.

At a meeting held in Grand Rapids, Mich., April 5, nearly all the Michigan roads were represented. The committee appointed at the previous meeting reported a constitution and by-laws, which were adopted. There was a discussion on summer excursion rates and on a request for special rates for commercial travelers, but no final action was taken and the meeting adjourned until May 3, at Detroit.

New Jersey Midland.

A recent circular from the bondholders' committee says that the foreclosure suit will soon be reached in the New Jersey Court of Chancery, and urges bondholders to deposit their bonds and sign the agreement. They also request all bondholders to inform them whether they received payment in money of the coupons of February and August, 1873, as some or all of these coupons are claimed to be still unaccounted for.

Baltimore & Ohio.

At the monthly meeting of the board of directors in Baltimore, April 11, it was voted unanimously to ratify the agreement with regard to freights recently concluded by the presidents of the trunk lines.

It was voted to declare the usual semi-annual dividend of 5 per cent. on the stock of the Main Stem. The board further decided to make no dividend on the stock of the Washington Branch, in consequence of the claim of the State of Maryland to the charter tax of 20 per cent. of the gross receipts from passenger travel.

Richmond & Danville.

For some time past a suit against this company has been pending in the Virginia Circuit Court, which was brought by the State to recover 12,000 shares of the company's stock and also about \$165,000 alleged to be due under the sale of the State stock to the company under the act of 1870. The State's claim was that under that act it was only intended to sell 12,000 shares, and further that in the settlement some allowances for interest had been improperly made to the company. The Court has now decided the questions at issue in favor of the company, holding that the act of 1870 must be taken as directing the sale of all the State stock; that the whole transaction was in good faith, and that the allowances were properly made. The only point conceded to the State was a small difference of \$26,571.46, due to a clerical error. This difference the company admitted and has several times offered to pay.

Cumberland & Ohio.

At a recent meeting of the board President Dulany presented his resignation, and in doing so reported that the grading and bridging of over 100 miles are completed and iron for 26 miles is on hand. The company is out of debt and has 26 subscriptions on hand for about \$1,000,000. Most of this amount, however, is not available until more work is done.

Vineland.

This road, which is 46½ miles long, from Bay Side, N. J., to Atsion on the New Jersey Southern, was sold under foreclosure in 1873 and bought by the bondholders. They did not, however, organize until two weeks ago, when they met in Camden, N. J., and organized the Vineland Railroad Company. It is understood that the new company will be consolidated with the New Jersey Southern as soon as the reorganization of that company is completed.

Credit Valley.

The city of Toronto, Ont., has voted a bonus of \$300,000 in aid of this road, which is partly graded and is to extend from Toronto to St. Thomas.

Western of North Carolina.

The stockholders have voted to change this road to narrow gauge and to proceed immediately with the work on its extension. It is now in operation from Fayetteville, N. C., northwest to Egypt, 43 miles, and the extension to be built is from Egypt to Greensboro, 55½ miles. It runs through a good and formerly a rich section of the State, and the extension will reach the large water-power and the factories on Deep River. The town of Fayetteville, its terminus, was formerly one of the

richest towns in the State, and was once the centre of a very large trade, tobacco, cotton and grain from a large section coming to it in wagons, and being shipped down the Cape Fear River to Wilmington. Most of this trade, however, has been diverted by the building of railroads leading to other points.

St. Louis & Southeastern.

In the United States Circuit Court at Springfield, Ill., recently, arguments were heard on the claims of the People's Bank, of Belleville, Ill., to a prior lien on the branch from Belleville to O'Fallon. The Court reserved its decision.

Chesapeake & Ohio Canal.

The late decision of the United States in the suit of Corcoran & Stewart against this company settles finally that the claim of the preferred bondholders for interest on their coupons from the time when they became overdue is not a lien to be settled prior to the debt to the State of Maryland. The coupons themselves are a preferred lien, but the interest on them is not.

Red River & Rio Grande.

The engineers are now making the final location of this road from Denison, Tex., to Gainesville, preparatory to letting contracts for grading.

Milwaukee & Dubuque.

This company desires to contract for the completion and equipment of 15 miles of road from Milwaukee westward, the grading being nearly done. Information can be obtained of J. H. Stearns, Secretary and Chief Engineer, at Milwaukee, Wis.

Southern Maryland.

Work has been resumed on this road and the ties are being distributed along the line between Charlotte Hall and Brandywine in Prince George County, Md.

Kansas City, Memphis & Mobile.

The Court having refused to confirm the former sale of this unfinished road it was recently sold again and purchased by J. D. Bancroft, of Kansas City, Mo., for \$15,000. Mr. Bancroft is making arrangements to organize a new company to complete the road, of which about 100 miles were graded several years ago. No rails were ever laid.

Toledo, Peoria & Warsaw.

Receiver Hopkins reports for February and March as follows:

Balance, Feb. 1.....	\$4,714 87
February receipts.....	136,687 11
March receipts.....	136,735 41
Total.....	\$277,137 39
February disbursements.....	\$119,403 23
March disbursements.....	132,160 99
Total.....	251,564 22
Balance, April 1.....	\$25,573 17

The receipts exceeded the disbursements by \$17,283.88 in February, by \$3,574.42 in March, and by \$20,858.30 for the two months.

Niagara Suspension Bridge.

A further examination of this bridge is to be made by two engineers, one appointed by the two bridge companies and one by the Great Western. Their report will be final.

Lake Superior & Mississippi.

Under the decree of foreclosure recently granted this road is to be sold in St. Paul, Minn., May 1, the sale including the 131 miles of road from St. Paul to Thompson Junction and one-half interest in 24 miles from Thompson Junction to Duluth. The holders of more than nine-tenths of the bonds have joined in the agreement for the purchase and reorganization of the road.

Central Vermont.

It is reported that, in consequence of the loss of the Vermont Valley road, a large part of this company's Southern and New York business, which has heretofore gone over the New London Northern road, will be sent over the Harlem Extension. This arrangement, although it would avoid the paying toll to the Vermont Valley, would shorten the Central Vermont's haul and diminish the business of the New London Northern road, for which it must pay a fixed rental.

New York Central & Hudson River.

Recently a number of remonstrances from residents along the Hudson River Division have been addressed to this company, representing that the passenger rates were higher than those for the same distances on any other line out of New York. In response to these the directors have resolved to reduce the local commutation rates from New York about 22 per cent. from May 1, 1877.

Boston, Clinton, Fitchburg & New Bedford.

The trouble between the new management of this company and the Framingham & Lowell, which arose from the debt incurred by the old management and its use of the credit of the Framingham Company, has, it is said, been settled by a mutual agreement. In consequence of this all opposition to the bill authorizing the Boston, Clinton, Fitchburg & New Bedford to issue preferred stock is to be abandoned, and the Framingham & Lowell is to withdraw its application for leave to issue \$600,000 second-mortgage bonds.

Florence, Eldorado & Walnut Valley.

The contract for grading and bridging this road from Florence, Kan., to Eldorado, 30 miles, was to be let this week, the work to be done by July 15. It is to be a branch of the Atchison, Topeka & Santa Fe and is built under the supervision of that company.

Ashuelot.

It is stated that arrangements have been made by which this road will pass into the hands of the Connecticut River Company as soon as the stockholders can comply with the recent decree and secure possession. As it stands now the Ashuelot road cannot be very valuable to the Connecticut River Company, but the object is doubtless to prevent the Central Vermont from getting the road and using it for its southern connection in place of the Vermont Valley.

Peterboro & Hillsboro.

The directors of this company have resolved to go on with the subscriptions already secured and have let the contract for the grading of the road to A. M. Shaw. He was to begin work this week at both ends of the line, at Peterboro, N. H., and Hillsboro Bridge. The road will be an extension of the Monadnock Railroad to a connection with the Concord & Claremont and will complete a line from Worcester, Mass., to Concord, N. H.

Florida Central.

For some time past this road has been worked separately from the Jacksonville, Pensacola & Mobile and has been in charge of a Receiver. Last week the Governor of Florida made a demand for the surrender of the road to the State as agent or trustee for the bondholders. The Receiver refused to surrender possession without further orders from a court of competent jurisdiction, whereupon the State Agent in charge of the Jacksonville, Pensacola & Mobile refused to deliver any more passengers or freight to the Florida Central at Lake City, and attempted to run his own trains through. This was pre-

vented by blocking the track, and at latest accounts the Receiver remained in possession of the Central, but all traffic was stopped. Meantime Jacksonville passengers are forwarded from Savannah by way of Brunswick and steamboat thence to Jacksonville.

Urbana & Chillicothe.

Surveys have been made for a narrow-gauge road from Chillicothe, O., northwest to Urbana by way of New Holland, Mt. Sterling and London. The distance is about 71 miles, and the engineer who made the surveys has offered to build the road for \$10,000 per mile.

Columbus & Toledo.

At the annual meeting in Columbus, O., April 1, President Greene reported that the road had been completed and equipped with 6 engines, 8 passenger and 4 baggage cars, 100 box, 50 stock, 100 flat, 297 coal and 6 caboose cars, the entire cost being under \$30,000 per mile. There is no floating debt except \$40,000 for real estate in Toledo and \$74,000, the contractors' retained percentage.

The stockholders voted to confirm the contract with the Pennsylvania Company for the use of the five miles of track from Walbridge to Toledo; also the contract with the Columbus & Hocking Valley Company for the use of terminal facilities in Columbus and the joint management of the two roads.

Spartanville & Asheville.

At a meeting held in Charleston, April 13, President Duncan stated that the grading is now completed from Spartanburg, S. C., to the summit at Pace's Gap, 35 miles. The iron is laid for 10 miles from Spartanburg, and rails for five miles more are on hand and being laid. About 10 miles more are graded on different sections and 400 men are at work, 200 of them convicts in North Carolina. The grading is all provided for by stock subscriptions, but \$44,000 cash is needed to secure the rails for the 20 miles to Pace's Gap. It is proposed to raise this by issuing bonds, and the Charleston people are asked to take part of the amount. Several of the depots have already been built by the people on the line, and a considerable traffic is expected when the road is open to Pace's Gap as there has always been a large wagon traffic to Spartanburg from the mountain country, and this 35 miles of railroad covers the hardest section of the road.

Louisville, Harrod's Creek & Westport.

This company has made a proposition to the Shelby and the Cumberland & Ohio companies which is now under consideration. It is to build a branch of the Harrod's Creek road (which is of 3 ft. gauge) from a point seven miles east of Louisville, Ky., to Anchorage, six miles; then to change the gauge or lay a third rail on the Shelby road to Shelbyville, 18 miles further, and to lay the track on the graded road-bed of the Cumberland & Ohio from Shelbyville to Bloomfield, 27 miles, completing a line 58 miles long from Louisville to Bloomfield. In case the arrangement is completed, the Cumberland & Ohio will reserve the right to take possession of the track laid on its road-bed whenever its own road is finished.

Burlington & Lamoille.

Work on the tracklaying on this road has been begun at Burlington, Vt., and a second gang was to be put on at Essex this week. The grading and bridging of the road was all completed last fall.

Long Island.

Recently this company secured permission to run steam cars on Atlantic avenue in Brooklyn, N. Y., from East New York to Flatbush avenue. The property-owners on the street were much opposed to the road, however, and in order to avoid an injunction the company, having secretly made preparations, put a large force of men at work late on the night of Saturday, April 14. The work was continued all Sunday, and by night the track a little over a mile was all laid and ready for use. The road ran through Atlantic avenue for many years, but some years ago the track was taken up and the terminus removed to Hunter's Point, just north and outside of Brooklyn.

Chicago & Southwestern.

In the case of Miller against Dows, trustee, the United States Circuit Court has affirmed the decree of foreclosure granted by the Circuit Court, under which this road was lately sold.

Northern Pacific.

A special meeting of the stockholders is to be held at the office in New York May 9, "To consider the company's interests in the St. Paul & Pacific Railroad, and secure the building of uncompleted portions of it. Also to consider the policy and mode of extending the Northern Pacific Railroad Company's road west of the Missouri River. Also to decide on the ways and means, by mortgage or otherwise, of finishing and equipping the company's branch to the Puyallup coal fields and extending the road from Kalama to Portland, Oregon."

Catskill & Schoharie Valley.

There has been a revival of interest in this project and several meetings have been held along the line to raise subscriptions. It is now proposed to make it a narrow-gauge road. Its cost, upon the basis of the survey made several years ago, is estimated at \$240,000. The road is to extend from the Hudson River at Catskill, N. Y., to Central Bridge on the Albany & Susquehanna road, about 40 miles. A railroad known as the Catskill & Canajoharie on nearly the same line was projected some 40 years ago and was completed and for several years in operation from Catskill to Cairo, 10 miles, but was afterwards abandoned and the iron taken up and sold.

Clover Hill.

The foreclosure sale of the railroad and coal property of this Virginia company has been postponed until April 25, at Richmond.

Illinois Midland.

The Receiver, Mr. Richard J. Rees, reports that the earnings of the road for the six months ending Feb. 28 were \$135,907; expenses and rentals, \$126,902; surplus, \$9,005. The sum of \$7,344 was expended for new iron, ties, ballasting and repairs of bridges. The business of the road is suffering from lack of sufficient equipment. The total floating liabilities are \$968,697, of which the sum of \$317,369 is due on Receiver's certificates; \$274,169 on judgments; \$50,000 on right of way claims and \$39,802 for taxes.

New Orleans, Mobile & Texas.

Notice is given that under the decree of the United States Circuit Court in the case of Morgan and Raynor, trustees, against this company, Mr. F. A. Woolley has been appointed Special Master to take account of the amounts due as principal and interest under the several mortgages included in the suit, and who are the owners of the bonds. Proofs may be presented to the Master at the office of E. D. Morgan, No. 54 Exchange place, New York, May 8 to 12, inclusive; at the office of the Clerk of the United States Circuit Court in Boston, May 15, and at the office of the Clerk of the United States Circuit Court in New Orleans, May 28 and 29. The examination of the proofs for the purpose of making up the report to the Court will take place at the last-named office (in New Orleans) between June 1 and 5. All bonds and coupons must be presented and proved in order to be included in the statement.

Atlantic, Tennessee & Ohio.

This road was to have been sold shortly under executions issued to enforce several judgments obtained in the United

States Circuit Court. Last week, however, an arrangement was concluded by which the North Carolina Railroad Company assumed the payment of these judgments, and received in return a controlling interest in the road. It is understood that there will be no immediate change in officers, but the management of the road will, of course, be in the interest of the North Carolina road.

The Atlantic, Tennessee & Ohio road is 43 miles long, from Charlotte, N. C., to Statesville. It runs through a very good country, hilly and well-wooded, and has a considerable local traffic. The object of the North Carolina Company in acquiring control is, doubtless, to secure this traffic and to prevent any diversion of the Western North Carolina business to Charlotte.

Wallkill Valley.

At a recent meeting of the first-mortgage bondholders in New York it was stated that the outstanding bonds were \$776,000 and the overdue coupons \$236,281. The Erie Railway has a claim for \$100,000 for train service furnished, and there is another preferred claim for \$3,500, making \$1,115,781 in all of preferred claims. The trustees were authorized to bid in the property at the foreclosure sale for not less than \$100,000, and a committee was appointed to prepare a plan of reorganization.

Ohio & Kentucky.

The foreclosure sale of this company's property is now advertised to take place in Covington, Ky., May 10. The sale includes 30 miles of railroad from the Ohio River at Sandburg, Ky., to the company's mines, the town plot of Sandburg, and some 80,000 acres of iron and timber lands in Carter, Lewis and Greenup counties in Kentucky.

Covington, Columbus & Black Hills.

The people of Knox County, Neb., have voted to issue \$100,000 bonds in aid of an extension of this road through the county.

Thomasville & Monticello Air Line.

This company has been fully organized and has contracted for a survey of the line, which was begun last week. The road is to run from Monticello, Fla., northward to Thomasville, Ga., the junction of the Main Line and Albany Division of the Atlantic & Gulf road. The distance is about 20 miles.

ANNUAL REPORTS.

Worcester & Nashua.

This company owns a line from Worcester, Mass., to Nashua, N. H., 45.68 miles, and it leases the Nashua & Rochester road from Nashua to Rochester, 48.5 miles. The last-named road, previously controlled and indeed built in the interest of the lessee, was formally leased on April 1, 1876, and its earnings are included for one-half the year covered by the present report, which is that ending Sept. 30, 1876.

The capital account is as follows:

Stock (\$39.181 per mile).....	\$1,780,800 00
Bonds (\$21.891 per mile).....	1,000,000 00
Bills and accounts payable.....	176,879 54
Profit and loss.....	230,925 79

Total (\$69,768 per mile)..... \$3,187,005 33

The company owns \$380,500 Nashua & Rochester stock. Expenditures on construction account for the year were \$32,129.27, of which \$31,316.17 were for the viaduct at Worcester, which has cost altogether \$109,136.56.

The work done for the year was as follows:

	1875-76.	1874-75.	Inc. or Dec. P. c.
Train mileage, passenger.....	172,793	172,793	0
" " freight.....	146,492	146,492	0
" " service.....	9,706	9,706	0

Total.....	329,991	311,993	Inc., 16,978 5.4
Passengers carried.....	346,800	342,134	Inc., 4,666 1.4
Tons freight carried.....	803,922	312,003	Dec., 4,919 2.6

The earnings for the year were as follows:

	1875-76.	1874-75.	Inc. or Dec. P. c.
Passenger Department.....	\$208,783 29	\$190,716 35	Inc., \$18,066 94 9.5
Freight Department.....	290,915 80	255,213 36	Inc., 35,702 44 19.1
Other sources.....	56,266 89	48,480 82	Inc., 7,786 77 16.1

Total.....	\$545,965 98	\$494,409 53	Inc., \$51,556 15 10.4
Expenses.....	344,728 33	336,079 21	Inc., 8,649 12 2.6

Net earnings.....	\$201,237 35	\$158,330 32	Inc., \$42,907 03 27.1
Gross earnings per mile.....	7,807 33	10,923 00	Dec., 3,015 68 27.9
Net earnings per mile.....	2,877 70	3,458 00	Dec., 580 30 17.0
Per cent. of expenses.....	63.14	67.98	Dec., 4.84 7.1

The net result of the year was as follows:

Net earnings.....	\$201,237 35	
Interest paid.....	\$76,703 79	
Rental of Nashua & Rochester road.....	56,550 00	
Dividends paid, 5% per cent.....	98,439 00	251,692 79

Deficit for the year..... \$30,455 44

In accordance with authority previously given by the stockholders, the time for the commencement of the Nashua & Rochester lease was fixed at April 1, 1876, and the cost of the road, on which the lessee pays 6 per cent. as rental, was fixed at \$2,000,000. The road does not now earn its rental, but it is believed that it will as business improves and its traffic is developed. The earnings of the Nashua & Rochester for the entire year (only half of which is included above) were:

Gross earnings (\$1,623 per mile).....	\$78,718 94
Expenses (78.85 per cent.).....	62,066 69

Net earnings (\$343 per mile)..... \$16,652 25

The gross earnings of the Worcester & Nashua on business derived directly from this connection were \$43,538.04. The business of the road has suffered from the crippled condition of its eastern connection, the Portland & Rochester road.

In March the road was seriously damaged by the breaking of a dam in Clinton, Mass., and the company is now suing the owners of the dam to recover the cost of repairing the road.

The Railroad Commissioners have awarded this company \$69,271.42 and land valued at \$5,000 more as damages for property and right of way taken from it for the extension of the Boston, Barre & Gardner track to the Union Depot in Worcester.

St. Louis, Kansas City & Northern.

This company owns and works the following lines:

	Miles.
St. Louis, Mo., to Harlem Junction.....	265.50
Northern Division, Moberly, Mo., to Iowa line.....	87.50
Union Depot Extension, Ferguson to Union Depot, St. Louis.....	11.00
Glasgow Branch, Salisbury, Mo., to Glasgow.....	15.00

Total owned..... 379.00

Hannibal & St. Joseph, leased, Harlem Junction to Kansas City..... 9.00

St. Louis & Cedar Rapids, leased, Iowa line to Ottumwa, Iowa..... 43.25

Boone County & Booneville, leased, Centralia, Mo., to Columbus..... 22.00

St. Joseph & St. Louis, leased, Lexington Junction, Mo., to St. Joseph..... 76.25

Total worked..... 539.50

The Union Depot Extension was opened for passenger traffic

June 12, and for freight two months later. The Glasgow Branch, originally a section of the Keokuk & Kansas City road, was acquired Sept. 1; it had previously been worked under a temporary lease. The nine miles from Harlem Junction to Kansas City, leased from the Hannibal & St. Joseph, are used in common with that company and as part of the main line of both roads. The present report is for the year ending Dec. 31, 1876.

The capital account at the close of the year was as follows:

Common stock	\$12,000,000 00
Preferred stock	12,000,000 00
Total stock (\$24,000,000 per mile)	\$24,000,000 00
Funded debt, \$18,451 per mile	6,939,000 00
Floating debt, less cash and balances due	2,383,265 19
Profit and loss	538,000 00

Total (\$38,141 per mile) \$38,842,265 19

The funded debt consists of \$6,000,000 North Missouri first-mortgage bonds and \$993,000 real estate and railroad mortgage bonds. The company has unissued \$2,000,000 of the last-named bonds, which it is intended to use in funding the floating debt. The company also owns 2,079 shares of its own preferred and 5,000 shares of its own common stock, and 5,380 shares, St. Louis & Cedar Rapids stock.

The mileage of locomotives and cars was as follows:

Locomotive mileage	2,587,730
Mileage of passenger-train cars	3,017,064
Mileage of freight cars, company's	16,256,472
Mileage of freight cars, foreign	7,888,082
Total	23,644,556

In locomotive mileage there was an increase of 400,400 miles, or 18.3 per cent., over 1875, entirely in freight mileage. The average cost of engine service per mile was 17.88 cents. The average cost of car repairs per mile was 1.78 cents for passenger and 0.37 cent for freight cars.

The earnings of the road worked for the year were as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Freight	\$2,164,470 99	\$1,727,602 68	Inc.	\$436,868 31 25.3
Passengers	848,028 35	777,268 77	Inc.	70,759 58 9.1
Mails	49,792 12	61,141 11	Dec.	11,348 99 18.6
Express	76,570 00	78,059 84	Inc.	3,510 16 4.5
Miscellaneous	5,004 82	4,760 78	Inc.	243 77 5.1
Total	\$3,143,865 98	\$2,648,833 15	Inc.	\$495,032 83 18.9
Working exp's	1,934,527 29	2,110,853 29	Dec.	176,326 00 8.3
Net earnings	\$1,209,338 69	\$537,979 86	Inc.	\$671,358 83 125.8
Gross earn. per mile	5,999 74	5,250 91	Inc.	748 83 14.3
Net earn. per mile	2,307 90	1,059 15	Inc.	1,248 75 117.9
Per cent. of expenses	61.53	79.83	Dec.	18.30 22.9

The income account may be summed up as follows:

Net earnings	\$1,209,338 69
Rent of track, Moulton to Bloomfield	14,000 00
Profit and loss	6,085 64
Total	\$1,229,424 33
Interest on bonded debt	\$489,510 00
Rentals of leased lines, St. Charles Bridge and St. Louis Union depot	223,734 40
Repairs, Hannibal & St. Joseph track	4,599 46
New York transfer agency	3,166 68
Interest and discount	131,281 70
Commission on coupons paid in New York	1,402 21
Rent of box cars and freight on cars	8,839 80
Use of tracks	140 00
Use of foreign cars, balance	15,043 55
Taxes for 1876, estimated	100,000 00
Net balance for the year	\$251,708 53
Debit balance from previous year	\$571,401 21
Adjustment of St. Charles Bridge back rent	184,250 00
Adjustment of St. Louis & Cedar Rapids back rent	90,556 39
Taxes for 1874 and 1875 over estimate	65,850 35
Debit balance, Dec. 31, 1876	\$660,351 42

The expenditures for construction during the year were \$784,107.75, the principal items being \$517,457.39 for the Union Depot Extension, \$40,782.09 for new sidings, \$70,224.69 for new bridges and \$91,363.68 for new equipment. The Union Depot Extension cost in all \$893,044, or \$81,186 per mile, the high cost being largely due to the great expense of securing right of way. During the year 43.72 miles of steel rails were laid on the Main Line and 2.32 miles iron rails on the St. Joseph Branch; 205,863 new ties were used in repairs. There were built 4.65 miles of new sidings east and 4.17 miles west of Moberly. A new bridge 170 feet span was built at Wakanda and 949 feet of truss and 7,254 feet of trestle bridge on the St. Joseph Branch. The equipment was increased by 220 box, 80 stock and 50 coal cars, to be paid for in monthly installments; for a part of the year 100 box cars were rented.

The large increase in earnings is attributed chiefly to the growth of local business, which the company has taken especial pains to foster. A greater increase was prevented by the sharp competition and cutting of rates on through freight. On Sept. 1 the company acquired the 15 miles of road from Salisbury to Glasgow on the Missouri River, which had been previously worked under a temporary lease. The price paid for this branch was only \$50,000, payable in certificates receivable for one-half of all charges on freight to or from stations on the branch. The road was built by the Keokuk & Kansas City Company two or three years ago.

St. Louis, Iron Mountain & Southern.

This company owns and works the following lines:

	Miles.
St. Louis, Mo., to Texarkana, Tex.	490.0
Bismarck, Mo. (75 miles south of St. Louis) to Belmont	120.0
Poplar Bluff, Mo., to Bird's Point (opposite Cairo, Ill.)	71.0
Mineral Point, Mo., to Potosi	3.5
Total	684.5

Its Main Line connects at Texarkana with the Texas & Pacific and through it with the entire Texas system of roads; the Belmont line connects by steam ferry across the Mississippi with the Mobile & Ohio, and the Cairo Line, also by ferry, with the lines terminating at Cairo. The equipment consists of 120 locomotives, of which 1 is rebuilding, 1 condemned and 2 are 4 ft. 8 in. gauge (the road is 5 ft.); 24 first and 14 second-class passenger, 2 sleeping, 3 passenger and baggage, 22 baggage, mail and express cars; 566 box, 442 Green Line box, 453 stock, 1,119 platform and 53 caboose cars; 1 directors', 1 boarding and 1 derrick car. The company also owns a half interest in 7 Pullman cars. The present report is for the year ending Dec. 31, 1876.

The company has a considerable land-grant, chiefly in Arkansas, from which 30,878.45 acres were sold during the year at an average of \$4.71 per acre, besides town-lots to the amount of \$7,700. The total amount of sales and collections on land notes was \$206,843.34, and the land notes on hand amount to \$401,362.41. A patent for 64,000 acres in Missouri has been issued since the close of the year.

The liabilities of the capital account are as follows:

Stock (\$21,425 per mile)	\$21,510,253 00
Bonded debt (\$36,226 per mile)	24,797,000 00
Real estate, long obligations	112,976 98
Funded coupon certificates and coupons unfunded	2,263,568 00
Accrued interest on funded debt, less land notes and cash	114,300 64
Balance of accounts payable	266,274 42
Bills payable	1,005,325 90
Rolling stock renewal fund	68,380 00
Total (\$73,213 per mile)	\$50,114,055 94

The work done for the year was as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Passenger train mile-ages	757,538	762,137	Dec.	4,597 0.6
Freight train mileage	1,139,133	1,066,220	Inc.	42,913 3.9
Total	1,896,671	1,828,357	Inc.	38,314 2.1
Total locomotive mile-ages	2,587,730	2,587,730	Inc.	105,688 4.1
Passengers carried	615,492	612,969	Inc.	3,523 0.6
Passenger mileage	29,185,441	28,220,188	Inc.	3,838,253 13.2
Tons freight carried	611,841	586,865	Inc.	25,976 4.4
Tonnage mileage	138,134,513	124,607,477	Inc.	13,527,036 10.8
Average pass. train load, No.	38.49	38.25	Inc.	5.24 13.5
Average freight train load, tons	121.26	114.50	Inc.	6.76 5.9
Average receipt per pass. per mile	3.50 cts.			
Average receipt per ton per mile	2.06 "			

Of the tonnage mileage 40.6 per cent. was of local and 59.4 per cent. of through business; 51 per cent. was north-bound and 49 per cent. south-bound freight, showing a nearly even traffic in both directions, and consequently a good average train-load. The average cost of locomotives per mile run was 20.2 cents; the average consumption of fuel, 61.5 lbs. of coal per mile, or 2.9 cords of wood per 100 miles.

The chief items of freight for the two years were:

	1876.	1875.	Inc. or Dec.	P. c.
Iron and zinc ore, tons	123,546	123,624	Dec.	78 0.1
Cotton, bales	273,162	189,634	Inc.	113,528 71.1
Lumber, tons	72,824	66,686	Dec.	13,871 16.0
Grain and flour, tons	79,787	106,077	Dec.	26,290 24.8
Meat, tons	27,772	29,993	Dec.	2,221 7.4
Stock, cars	3,262	3,140	Inc.	122 3.9

Of the cotton carried in 1876, 100,294 bales were through cotton from Texas, and 172,868 bales from Arkansas stations on the line.

The earnings from this traffic were as follows:

	1876.	1875.	Inc. or Dec.	P. c.
Freight	\$2,842,761 51	\$2,738,837 61	Inc.	\$103,923 90 3.8
Passengers	974,032 18	880,039 13	Inc.	94,723 05 10.7
Mail and express	188,046 39	166,168 09	Inc.	21,878 30 13.2
Other sources	27,175 04	23,896 83	Inc.	3,278 21 13.7
Total	\$4,032,045 12	\$3,802,941 36	Inc.	\$229,103 76 5.2
Working exp's	2,035,720 07	2,018,863 83	Inc.	21,856 24 1.1
General expenses	187,729 96	142,686 78	Inc.	15,043 18 10.5
Exp's prior years	137,870 10	32,477 39	Inc.	105,392 77 323.4
Total	\$2,331,020 19	\$2,189,018 00	Inc.	\$142,002 19 6.5

Net earnings	\$1,671,024 93	\$1,613,923 36	Inc.	\$57,101 57 3.5
Gross earn'g per mile	5,846 66	5,555 80	Inc.	290 86 5.2
Net earnings per mile	2,441 23	2,357 82	Inc.	83 41 3.5
Per cent. working expenses	50.87	52.96	Dec.	2.09 3.9
Per cent. all exp's	58.25	57.56	Inc.	0.69 1.2

There were also expended for track and bridge renewals and repairs of wash-outs in 1876 \$187,379.43, which, if added to expenses, would make the percentage of expenses to earnings 62.93. The expenses of prior years paid were chiefly taxes. Expenditures for new construction and equipment were \$228,447.74.

The income account may be summed up as follows:

Net earnings	\$1,671,024 93
Balance from previous year	13,544 84
Total	\$1,684,569 77
Track and building renewal account	\$37,379 43
Premium on gold coupons	33,683 51
Discount on consolidated bonds	8,100 00
Interest on funded debt	121,014 46
" " bonded debt	1,762,095 00
" " funded debt (funded coupons)	139,248 10
Debtor balance at close of year	416,950 83

During the year a number of bridges have been rebuilt or enclosed and several bridges put in at points where wash-outs had occurred; stone abutments were built for several bridges. A large number of minor buildings were erected or rebuilt and several depots built, including a freight house in St. Louis and a transfer depot at the Little Rock & Fort Smith Crossing; several additions were made to the shops at Baring Cross, Ark., and work begun on extensive new shops at De Soto, Mo. There were used in renewals 1,733 tons steel and 964 tons iron rails and 225,089 ties; 8.11 miles of new sidings were laid and much ballasting done.

President Allen's report speaks of the proposed change from 5 ft. to 4 ft. 8 in. gauge and mentions in this connection that during the year 22,592 cars were transferred to and from connecting lines of 5 ft. gauge at Belmont, while 5,076 were transferred to and from lines of 4 ft. 8 in. gauge at Cairo and 6,490 at Texarkana; the latter, however, was not the full number of loaded cars received there.

Mr. Allen further refers to the proposal made in October to still further extend the funding of coupons, and says it was made at the suggestion of some of the largest holders of bonds. The increase of earnings has not been so large as expected, but the belief is expressed that the net earnings of the current year, with the proceeds of land sales, will be sufficient to meet all demands.

Utica & Black River.

This company owns a line from Utica, N. Y., a little west of north to Philadelphia, 87.06 miles, and it leases the Black River & Morristown road, which is an extension of this line from Philadelphia north to Morristown on the St. Lawrence, 36.21 miles; the Clayton & Theresa road, from Theresa Junction west to Clayton on the St. Lawrence, 15.87 miles, and the Carthage, Watertown & Sackett's Harbor road, from Carthage westward to Sackett's Harbor on Lake Ontario, 29.59 miles, making 168.73 miles in all. The report covers the year ending Sept. 30, 1876, during the first two months of which only 146.73 miles were worked, the last 23 miles of the Black River & Morristown road not having been completed until near the end of November, 1875.

The equipment consists of 18 engines, 10 passenger and 9 baggage cars and 210 freight cars.

The capital account at the close of the year was as follows:

Stock (\$20,365 per mile)	\$1,771,720 00
Bonds (\$12,782 per mile)	1,112,000 00
Sundry accounts and balances	57,658 35
Surplus fund	148,321 36
Total (\$35,514 per mile)	\$3,089,699 71

The company holds \$129,000 Clayton & Theresa bonds,

\$15,000 stock and \$40,000 bonds of the Black River & Morristown Company, and has made advances of \$14,287.24 to the former and \$55,342.49 to the latter company.

Expenditures on construction account for the year were \$61,244.55, of which \$37,379.53 was for new cars. There was expended on the completion of the Black River & Morristown road \$425,342.49, of which \$370,000 was paid in bonds of that company.

The freight traffic for the last four years was: 1872-73, 106,950 tons; 1873-74, 116,750 tons; 1874-75, 105,074 tons; 1875-76, 104,698 tons. There was a large increase last year in heavy freights, as stone, etc., but a large decrease in grain and lumber.

The earnings for the year were as follows:

	1876-76.	1874-75.	Inc. or Dec.	P. c.
Passengers	\$208,626 02	\$201,879 38	Inc.	\$6,746 64 3.3
Freight	249,934 10	263,095 84	Dec.	13,161 74 5.0
Other sources	38,111 35	38,422 13	Dec.	5,310 78 13.8
Total	\$496,671 47	\$503,397 35	Dec.	\$6,725 88 1.3
Working expenses	287,372 23	251,650 82	Inc.	35,721 41 14.2
Net earnings	\$209,300 24	\$251,746 53	Dec.	\$42,446 29 20.3
Gross earn. per mile	2,970 22	3,475 04	Dec.	498 82 14.9
Net " "	1,237 57	1,739 35	Dec.	501 78 28.9
Per cent. of expenses	58.46	49.99	Inc.	8.47 16.9

The income account for the year was as follows:

Net earnings	\$209,300 24
Surplus fund Sept. 30, 1875	184,321 36
Total	\$393,621 60

Utica & Black River coupons \$77,490 00
Clayton & Theresa coupons 14,000 00
Black River & Morristown coupons 22,590 16
Carthage, Watertown & S. H. road 19,962 87
Utica & Black River dividends, 6 per cent. 106,248 00

Surplus, Sept. 30, 1876 \$148,321 36

The surplus was reduced by \$36,031.49 during the year. The rental paid for the Carthage, Watertown & Sackett's Harbor road is 37 1/2 per cent. of the net earnings; for the other lines only interest on the bonds is paid.

The increase in expenses was largely due to the purchase of nearly two years' stock of wood in one. During the year 473 tons of new iron and 43,360 new ties were laid; a new freight house at Utica completed; 30 miles of telegraph line built and two new passenger cars bought.

The report of President De Witt C. West is long and interesting. He attributes the loss in earnings to the competition of the Rome, Watertown & Ogdensburg and the Ogdensburg & Lake Champlain roads, and to the discouragement of grain-growing along the line by the extremely low rates on Western grain. The people on the line are turning their attention to dairy products, which give the road a much less bulk of freight. He complains also of excessive taxation and of the unreasonable attempts made to limit the tariffs to the same maximum charges as the New York Central's, regardless of the different conditions governing the cost of transportation.

Experiments Made by the Eastern Railroad Association.

The Springfield (Mass.) Republican of recent date says:

A very interesting series of experiments have been in progress on the Boston & Albany road the past few days by means of the dynamograph-car of the Eastern Railway Association, in charge of P. H. Dudley, which has been run between Springfield and Worcester on both freight and passenger trains to test the relative amount of power required at different points along the road, especial reference being had to the Springfield and Charlton grades. The experiment on the modoc train east, leaving Springfield at 6:30 a. m., which on the day in question consisted of two sleepers, four passenger and baggage-cars and the dynamograph-car, showed power required as follows: For the first 2,920 feet out of the depot the tension on the draw-bar was 6,526 pounds; for the next mile 6,460 pounds, the rate of speed being 32 miles per hour; for the next 6,200 pounds, the speed being 36 miles, and for the last 1,100 feet to the top of the grade 6,250 pounds. The last mile required the engine to produce 19,625,800 foot-pounds of power per minute, the term foot-pound indicating the power required to lift one pound one foot. In going up the grade from East Brookfield to Charlton, beginning at the station, the tension on the draw-bar for the first 3,880 feet was 5,722 pounds; for the first full mile, the velocity being 37.5 miles, 4,280 pounds; for the second mile, with 37 miles velocity, 5,232 pounds; third, with 36 miles velocity, 5,450 pounds; fourth, which contains a sharp curve, with 37 miles velocity, 5,612 pounds; fifth, with 41 miles velocity, 5,230 pounds; and, sixth, which ran a little past the summit at Charlton, 4,356 pounds. The engine had 18 by 24 cylinder, and the track was in excellent condition. The maximum of the Springfield grade is 60 feet to the mile and the Charlton grade 51.47 feet. At the sharpest curve the grade is about 49 feet. Similar experiments were made on a freight-train of 27 cars drawn by the Adirondack, famous for her trials with the Mogul engine last summer, and showed that the tension on the draw-bar going up Springfield grade at a speed of 5.9 miles per hour was about 16,000 pounds, and the average strain going up Charlton grade at an average speed of about nine miles per hour was 14,500 pounds, the power required in the first instance being 84,840,000 foot-pounds. Near the top of the grade the power of the engine was tested by applying the brakes, and it was found that, running at four miles per hour, the engine could exert a tension of 17,000 pounds. Beyond this point the drivers would slip and little progress was made.

Really, the most important experiments in which the association is just now engaged are in testing the quality of iron and steel used for bridges, rails, axles and car wheels. Recent trials of the tenacity of iron used for various bridges and car axles indicate that much of the iron now in use will only stand about two-thirds the strain which it is guaranteed to resist. For instance, some iron now being put into a new bridge at the East, which is supposed to stand a pressure of 60,000 pounds to the square inch, breaks readily at 40,000 pounds, and a car axle supposed to be equal to 110,000 pounds snapped at 70,000. When it is borne in mind that the calculations of bridge-building engineers are based on the guaranteed strength of the iron, the reason for the fall of iron bridges becomes apparent at once, and, instead of wondering at an Ashtabula horror, the wonder rather is that it is not repeated.

The Eastern Railroad Association, which is making these experiments, is composed of all the railroads on the Atlantic coast north of Richmond, Va., and east of Pittsburgh and the Alleghenies, and was organized about 10 years ago, having for its object the investigation of the validity of patents and claims to royalties for the use of the same. S. M. Whipple of South Adams is the General Agent. The scope of the association has naturally broadened, and it has been for the past few years largely engaged in testing the merits of various railway equipments with the idea of getting the best in every department. The dynamograph car is a curiosity in itself, containing, besides the dynamograph, which is a wonderful instrument registering exactly the amount of power required to pull a train, a chronograph which records the speed of the train every 7 1/2 seconds, an anemometer which registers the velocity of the wind, whether natural or caused by the motion of the cars, and a complete set of instruments for testing the hardness, tenacity, ductility, density and the amount of carbon in rails, axles and the like.

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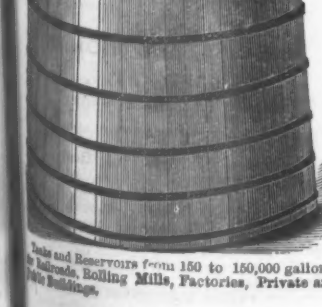
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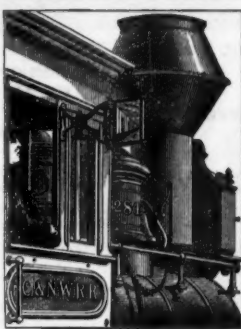
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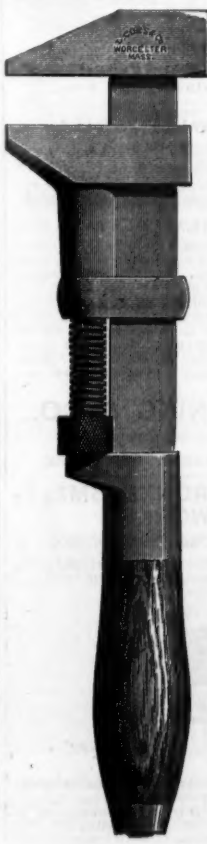
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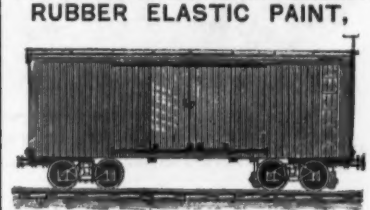
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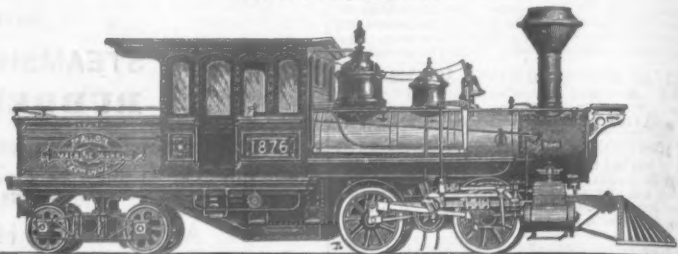
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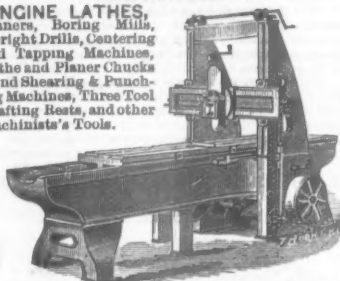
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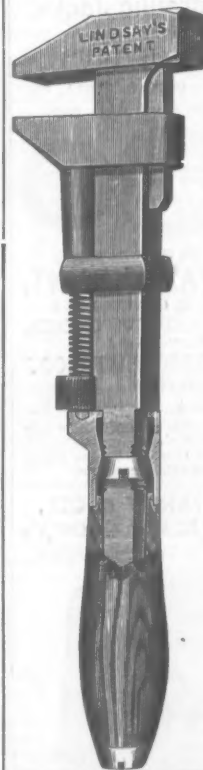
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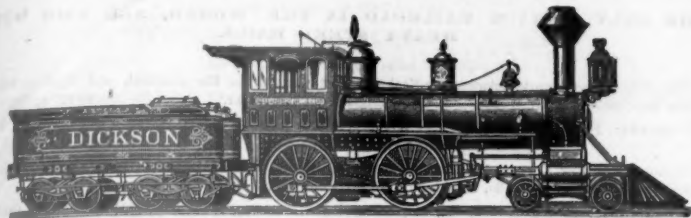
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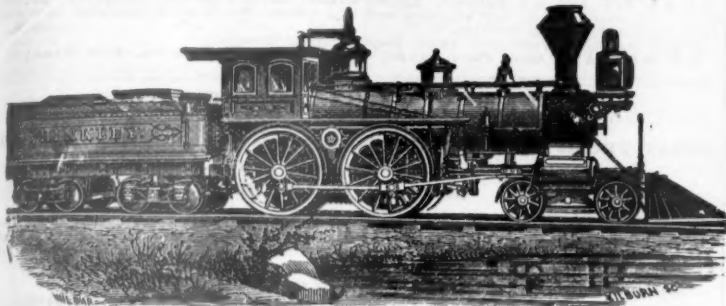


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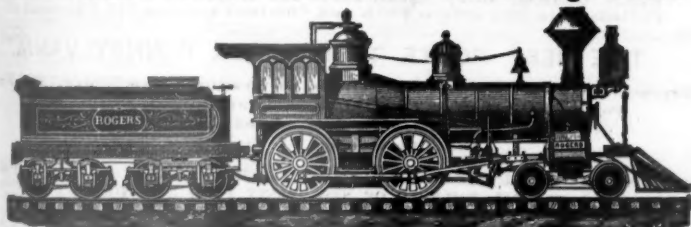
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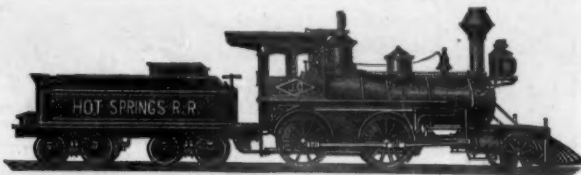
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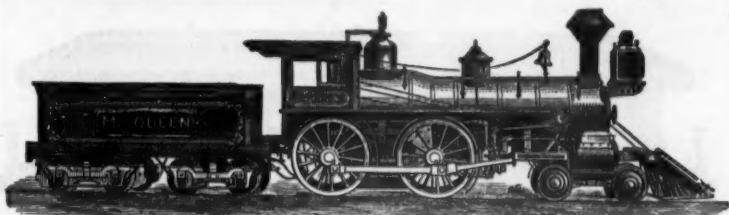
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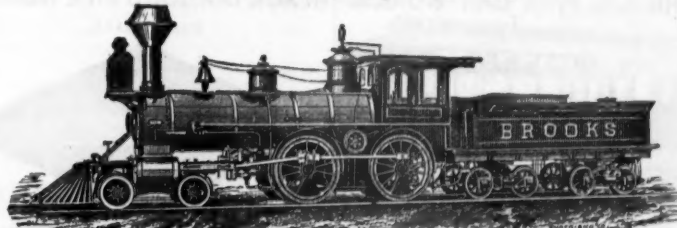
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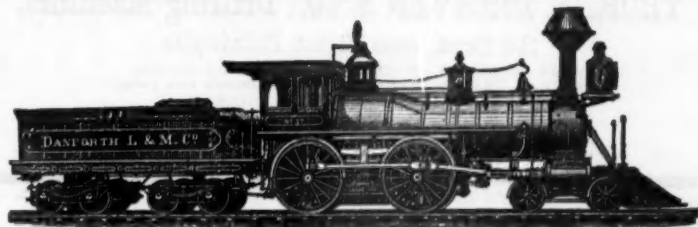
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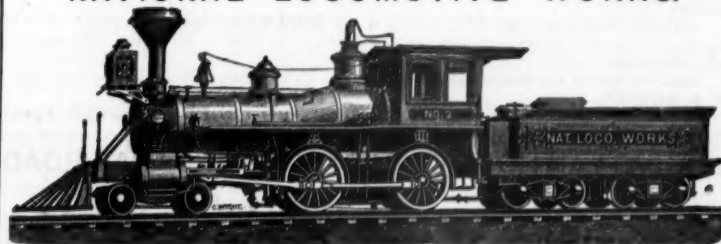
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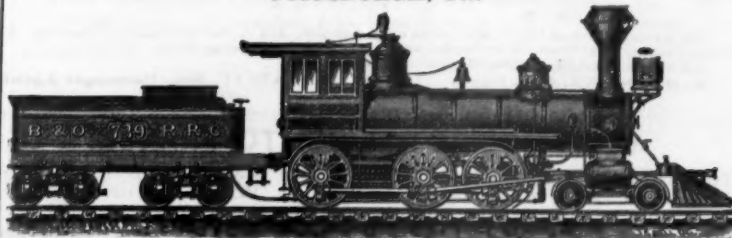


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All Material and Workmanship Guaranteed to be of the Very Best.

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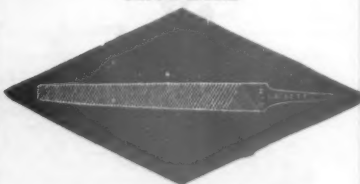
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TO THE TRAVELING PUBLIC.

During the Centennial Season—six months, closing November 10, 1876—the Erie Railway carried almost 3,000,000 passengers, without a single accident to life or limb, or the loss of a piece of baggage.

And for a whole year, the official records of the United States Post Office Department show the arrivals of Erie Railway trains in New York, on time, to be from 15 to 27 per cent. ahead of competing lines.

Facts well worthy the consideration of travelers.

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THE ATLANTIC & GREAT WESTERN RAILROAD,
in connection with the
ERIE RAILWAY.

form the Great Broad-Gauge Route to the WEST and SOUTH. For Chicago, Cleveland, Omaha and all points in the Northwest. For Cincinnati, Louisville, St. Louis, Kansas City and points in the Southwest.

THIS IS THE ONLY LINE, in connection with the Erie Railway, which runs through sleeping coaches from New York and local stations to Chicago, Cleveland, Mansfield, Galion, Dayton and Cincinnati without change.

The Southern system of railways are now running palace sleeping coaches from Cincinnati (in direct connection with express trains on this line) to Memphis, Jackson and New Orleans; from Cincinnati to Nashville, Decatur, Montgomery, Mobile and New Orleans—making but one change from New York to any prominent point South—via this line.

For through tickets at lowest rates, palace coach locations, and further information concerning the route, please apply at ticket offices Erie Railway and at offices of connecting lines.

Ask for tickets via the Atlantic and Great Western Railroad.

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ONLY DIRECT LINE TO FRANCE.

The General Transatlantic Company's Mail Steamers Between New York and Havre, Calling at Plymouth, (G. B.), for the landing of Passengers.

The splendid vessels of this favorite route for the Continent (being more southerly than any other) will sail from pier No. 43, North River, as follows:

ST. LAURENT (Lachenes).....WEDNESDAY, April 18, at 9:30 a.m.

PRICE OF PASSAGE IN GOLD (including wine): First cabin, \$110 to \$150, according to accommodation. Second cabin, \$72. Third cabin, \$40. Return tickets at reduced rates.

Steorage, \$20, with superior accommodation, including wine, bedding and utensils, without extra charge.

LOUIS DE BEHIER, Agent, 55 Broadway.

NEW YORK CENTRAL & HUDSON RIVER R. R.

THE ONLY 4-TRACK RAILROAD IN THE WORLD, ALL LAID WITH HEAVY STEEL RAILS.

This is the favorite route between the East and West, sixty miles the shortest, and eight to twelve hours the quickest between Boston and New England and the West.

Wagner Palace Sleeping and Drawing Room Cars Attached to All Trains.

Through cars New York and Boston to Buffalo, Niagara Falls, Cleveland, Toledo, Detroit, Chicago, Indianapolis, Louisville and St. Louis, &c. No extra charge via Niagara Falls.

New York Ticket Offices—232, 261, 418, 785 and 942 Broadway; 7 Park Place and Grand Central Depot.

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NEW YORK AND NEW ENGLAND RAILROAD.
FOUR POPULAR LINES.

New and popular line between Boston and Philadelphia without change of cars, via N. Y. & N. E. R. R. & P., N. Y., N. H. & H. Railroads. Transfer steamer Maryland (between Harlem River and Jersey City). Two express trains, each way, each week day, between Boston and Philadelphia. Most direct route between Boston and Brooklyn.

Elegant drawing-room cars on all trains. Baggage checked through.

A. C. KENDALL, Gen. Pass. Agent.

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GREAT TRUNK LINE AND UNITED STATES MAIL ROUTE. THE BEST CONSTRUCTED AND MOST COMPLETELY EQUIPPED RAILWAY IN AMERICA.

Connecting all the principal cities on the Atlantic Coast with those in the Mississippi Valley and on the Great Lakes. Through trains with Palace Cars attached, between New York, Philadelphia, Washington and Baltimore and Chicago, St. Louis, Cincinnati and Louisville.

Baggage Checked to Destination. Fare always as low as by any other route.

For tickets, palace and parlor car accommodations, and all desired information, apply at the office of the Company: Nos. 208 and 206 Washington st., Boston; No. 1 Astor House, Nos. 826 and 944 Broadway, and Des Moines and Cortlandt street ferries, New York; Nos. 888 and 1348 Chestnut street, and Depot Thirty-second and Market streets, Philadelphia; N. E. cor. Baltimore and Calvert streets, Union Depot and Northern Central Railway Depot, Baltimore; N. E. corner Thirteenth street and Pennsylvania avenue, N. E. corner Sixth street and Pennsylvania avenue, and Baltimore and Potomac R. R. Depot, Washington City.
FRANK THOMPSON, General Manager

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THE SHORT AND FAVORITE ROUTE FROM PHILADELPHIA To the Lehigh, Wyoming and Susquehanna Valleys, Scranton, Elmira, Rochester, Buffalo, Niagara Falls and New York State, the West and Northwest.

FAST TIME, SURE CONNECTIONS, PARLOR AND SLEEPING CARS. Philadelphia Passenger Depot, Berks and American Streets.

Daily Fast Freight Trains are run between Philadelphia and the above-named districts, delivering freight with regularity and dispatch on terms as low as any other route.

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Philadelphia City Offices: Fifth and Chestnut sts. and 733 Chestnut st.

THE BEST ROUTE TO INTERIOR PENNSYLVANIA.

Express Trains daily from Philadelphia to Reading, Harrisburg, Tammany, Pottsville, Mahanoy City, Ashland, Shamokin, Danville, Williamsport, and all points on the Coal, Lumber and Ore Regions of the State.

EXPRESS TRAINS FROM ALLENTOWN FOR SAME POINTS IN CONNECTION WITH TRAINS OF CENTRAL RAILROAD OF NEW JERSEY FROM NEW YORK.

Purchase Tickets via Reading.

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CLEVELAND, COLUMBUS CINCINNATI & INDIANAPOLIS RAILWAY.

THE GREAT CENTRAL TRUNK ROUTE TO THE OHIO AND MISSISSIPPI RIVERS.

Evening trains leave CLEVELAND daily with Rotunda Sleeping Cars, for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE, TERRE HAUTE, EVANSVILLE, ST. LOUIS and all points West and South.

Morning trains leave daily except Sunday, with through Palace Coaches, for COLUMBUS, CINCINNATI, INDIANAPOLIS, LOUISVILLE and ST. LOUIS without change.

This is the only line making direct connection with all the Principal Trunk Lines of the East for NASHVILLE, MEMPHIS, NEW ORLEANS and all points in Texas, either by way of LOUISVILLE or ST. LOUIS.

Direct connection at ST. LOUIS for all Railway Towns in Kansas, Nebraska and Colorado.

EQUIPMENT COMPRISES ALL VALUABLE IMPROVEMENTS.

THE BEST ROAD-BED AND SAFEST ROAD IN THE WEST.

Tickets by this route for sale at all regular ticket offices.

E. S. FLINT,
General Superintendent.

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VIA OMAHA.

THE ONLY DIRECT ALL RAIL ROUTE; being 226 miles the Shortest Route. Salt Lake, Sacramento, San Francisco, and the Mining Districts of Utah, Nevada, California, etc., etc.

Five Hours the Quickest Route to Denver.

Close connections made at Cheyenne with Denver Pacific Railway. At Denver with the Colorado Central. At Golden City with Daily Coaches for the Mines. At Denver with Denver & Rio Grande Railway for all points in Southern Colorado, New Mexico and Arizona.

Baggage checked through from Chicago to Denver, and from Omaha to Salt Lake City, Sacramento, San Francisco, etc.

T. E. SICKELS,
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THE EMPIRE TRANSPORTATION COMPANY OFFERS TO THE BUSINESS COMMUNITY A RELIABLE FAST FREIGHT LINE BETWEEN THE EAST AND THE WEST AND THE GREAT OIL REGION OF PENNSYLVANIA.

Via the Philadelphia & Erie Railroad and its Connections.

IT OWNS AND CONTROLS ALL THE CARS OF ITS LINE, which are new and built expressly for its trade, and furnished with BROAD TREAD WHEELS, which enable it to run through irrespective of change of gauge, thus avoiding the injurious delays prevalent at transshipping points.

The Line is managed by men of long experience in the business, and so effort will be spared on their part to render satisfaction to its patrons.

Parties ordering goods from the East will please direct shippers to mark packages "EMPIRE LINE," and refer them to the agents of the company for shipping directions, &c., &c.

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AN IMPORTANT LINK IN THE

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Between the East and West.

THREE EXPRESS TRAINS EACH WAY DAILY. THE ONLY LINE EAST FROM CHICAGO RUNNING THE CELEBRATED DINING CARS.

WAGNER SLEEPING AND PARLOR CARS.

THROUGH CARS FROM AND TO

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H. B. LEDYARD, Gen'l Sup't, Detroit. HENRY C. WENTWORTH, Gen'l Pass. and Tkt. Agt., Chicago.

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Leave New York from foot of Desbrosses and Cortlandt streets: 8:40 a. m. for Washington and the West, Richmond, Charleston and the South. Pullman Parlor cars from New York to Baltimore and Washington, making close connection for Cincinnati, St. Louis, Louisville, etc.

8 p. m. for Washington, Pittsburgh, Cincinnati, Chicago, and for Richmond, via Gordonsville. Pullman cars from New York to Baltimore and Washington.

9 p. m. daily for Washington, the South and West. Pullman's sleepers from New York to Baltimore and Washington, making close connections for Chicago, Cincinnati, Louisville, St. Louis, Pittsburgh, the South and Southwest. Connect at Washington with trains for Lynchburg, Florida, New Orleans and the South. For through tickets please call at Company's office, 315 and 438 Broadway, New York; and at the ticket offices, foot of Cortlandt and Desbrosses streets; and Depot, Jersey City.

ASK FOR TICKETS VIA BALTIMORE & OHIO RAILROAD.

PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD.

The connecting link between the EAST, WEST, NORTH, SOUTH, the centre of the GREAT THROUGH LINE between the cities of NEW YORK, PHILADELPHIA, BALTIMORE and WASHINGTON, the only route between the EAST, WEST and SOUTHWEST, via WASHINGTON, D. C., and the shortest and only direct route between the NORTH and SOUTH.

In every respect a first-class Railway. Tickets via BALTIMORE for sale in all principal ticket offices throughout the country.

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CHICAGO, MILWAUKEE & ST. PAUL RAILWAY.

THE DIRECT ROUTE TO

MILWAUKEE, ST. PAUL AND MINNEAPOLIS,

And all portions of Wisconsin, Minnesota and Northern Iowa.

Purchase Tickets Via Milwaukee.

Passengers going via this NEW DIRECT ROUTE to Milwaukee leave from and arrive at the most Central and best located Depots in Chicago, Milwaukee and St. Paul.

BAGGAGE CHECKED THROUGH BY THIS ROUTE!

Passengers from Chicago can obtain these Advantages only by taking the trains of Chicago, Milwaukee & St. Paul Railway, at Union Depot, corner West Madison and Canal streets.

SPECIAL NOTICE.

This Line connects more important Business Centres than any other route in the Northwest, is as short as the shortest, and is fully equipped with the best of Day and Sleeping Coaches.

A. V. H. CARPENTER,
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T. E. CHANDLER,
Passenger and Ticket Agent, 37 West Madison street, Chicago.S. S. MERRILL,
Gen. Manager, Milwaukee.

CHICAGO & NORTHWESTERN RAILWAY.

This great corporation now owns and operates over two thousand miles of road radiating from Chicago like the fingers of a man's hand, its lines reach in all directions and cover about all of the country north, northwest and west of Chicago. With one branch it reaches Racine, Kenosha, Milwaukee and the country north thereof; with another line it pushes through Janesville, Watertown, Oshkosh, Fond du Lac, Green Bay, Escanaba to Negaunee and Marquette; with another line it passes through Madison, Troy and for St. Paul and Minneapolis; branching westward from Elroy it runs to and through Winona, Preston, St. Peter, Mankato, New Ulm, and stops not until Lake Kampesch, Dakota, is reached; another line starts from Chicago and runs through Elgin and Rockford to Freeport, and, via the Illinois Central, reaches Warren, Galena and Dubuque; and the country beyond. Still another line runs almost due westward, and passes through Dixon, Sterling, Fulton, Clinton (Iowa), Cedar Rapids, Marshalltown, Grand Junction, Missouri Valley Junction, to Council Bluffs and Omaha. This last-named is the "Great Trans-Continental Route," and the pioneer overland line for Nebraska, Colorado, Utah, Idaho, Montana, Nevada, California and the Pacific Coast. It runs through the Garden of Illinois and Iowa, and is the best, safest, shortest and quickest route for Omaha, Lincoln and other points in Nebraska, and for Cheyenne, Denver, Salt Lake City, Virginia City, Carson, Sacramento, San Francisco, and all other points west of the Missouri River.

On the arrival of the trains from East or South, the trains of the Chicago & Northwestern Railway leave CHICAGO as follows:

For Council Bluffs, Omaha and California—Two through trains daily, with Pullman Palace Drawing Room and Sleeping Cars through to Council Bluffs.

For St. Paul and Minneapolis—Two through trains daily, with Pullman Palace Drawing Room Sleeping Cars attached, for St. Paul and through to Minneapolis.

For Green Bay and Lake Superior—Two trains daily, with Pullman Palace Cars attached.

For Milwaukee—Four through trains daily. Pullman Cars on night trains. Pullman parlor chair cars on day trains.

For La Crosse, Wis., Winona and points in Minnesota—One through train daily, with Pullman sleepers to Winona.

For Dubuque via Freeport—Two through trains daily, with Pullman Cars on night train.

For Dubuque and La Crosse via Clinton—Two through trains daily, with Pullman cars on night train to McGregor, Iowa.

For Sioux City and Yankton—Two trains daily. Pullman cars to Missouri Valley Junction.

For Lake Geneva—Four trains daily.

For Rockford, Sterling, Kenosha, Janesville and other points you can have from two to ten trains daily.

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General Manager. Gen. Ea. Agt., 415 Broadway, N. Y. city. General Passenger Agent.

CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.

The direct route for Joliet, Morris, Ottawa, LaSalle, Peru, Henry, Peoria, Lacon, Geneseo, Moline,

ROCK ISLAND, DAVENPORT,

Muscatine, Washington, Iowa City, Grinnell, Newtown, Des Moines,

COUNCIL BLUFFS AND OMAHA,

Connecting with Trains on the Union Pacific Railroad for CHEYENNE, DENVER, CENTRAL CITY, OGDEN, SALT LAKE, WHITE PINE, HELENA, SACRAMENTO, SAN FRANCISCO, and Points in Upper and Lower California, and with Ocean Steamers at San Francisco, for all points to China, Japan, Sandwich Islands, Oregon and Alaska.

DEPOT, HEAD OF LA SALLE STREET; TICKET OFFICE, 56 CLARK STREET.

OMAHA AND LEAVENWORTH EXPRESS (Sundays excepted)..... 10.15 A. M. 4.00 P. M.
FURNISH ACCOMMODATION (Sundays excepted)..... 5.00 P. M. 9.35 A. M.
OMAHA AND LEAVENWORTH EXPRESS (Saturdays excepted)..... 10.00 P. M. 6.50 A. M.

KANSAS LINE.

The Chicago, Rock Island and Pacific Railroad Company have now opened their South Western Division, between

LEAVENWORTH, ATCHISON AND CHICAGO.

CONNECTING WITH KANSAS RAILROADS,

For all points in Western Missouri, Colorado and the Territories.

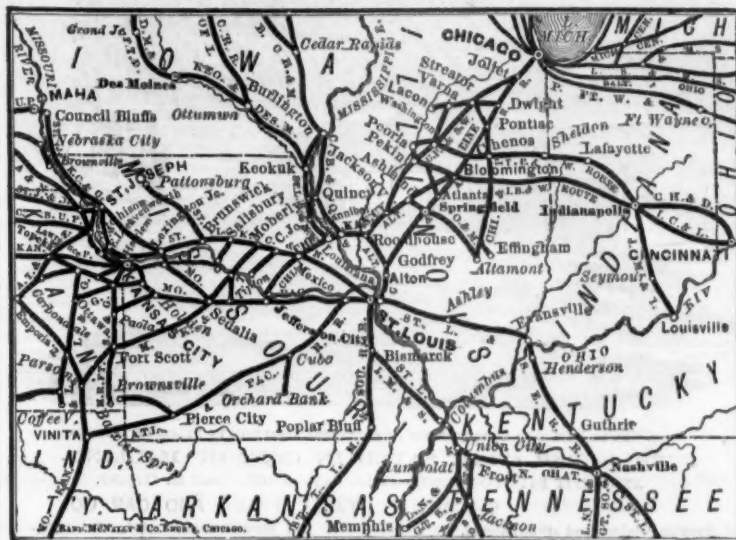
The Company have built a full complement of PALACE DRAWING ROOM AND SLEEPING CARS, which for external beauty and interior arrangements for the comfort, convenience and luxury of passengers are unequalled, if equaled, by any other cars of the kind in the world.

For Through Tickets and all desired information in regard to Rates, Routes, etc., apply to the Company's Offices, Chicago, or 337 Broadway, New York.

WUGH RIDDLE, Gen. Supt. A. M. SMITH, Gen. Pass. Agent.

CHICAGO, ALTON & ST. LOUIS

AND

CHICAGO, KANSAS CITY & DENVER
SHORT LINES.

The Best Line, via St. Louis, to Memphis, Mobile, New Orleans and all points South.

THE SHORT LINE TO TEXAS, VIA ST. LOUIS.

No change of cars on any train by this line between Chicago and St. Louis. Pullman Palace Sleeping Cars—the newest, safest and best in use on any road—run through between Chicago and Springfield and Chicago and St. Louis without change. Meals in Dining Cars only 75 cents. No change of Reclining Chair Cars and Pullman Palace Sleeping Cars between Chicago and Kansas City. No extra charge for seats in Reclining Chair Cars. Two hours the quickest route from Chicago to KANSAS CITY, DENVER, PUEBLO and all points in Kansas and Colorado. No change of cars between Chicago and Peoria.

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General Superintendent, Chicago.

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Trains Leave Chicago from the Great Central Depot, of Lake Street
CHICAGO AND ST. LOUIS THROUGH LINE.

No Change of Cars to St. Louis!

8.40 A. M. DAY EXPRESS. Sundays Excepted. Arriving St. Louis at 8.30 P. M. ing at St. Louis at 8.30 A.
8.45 P. M.

CAIRO, MEMPHIS, MOBILE AND NEW ORLEANS LINE.

No Change of Cars to New Orleans!

8.40 A. M. DAY EXPRESS. Sundays excepted, arriving at Cairo 2.30 A. M.;
Memphis, 5.15 P. M.; Vicksburg, 10.10 A. M.;
Mobile, 8.00 A. M.; and New Orleans at 11.45 A. M.
4.30 P. M. GILMAN PASSENGER. Sundays Excepted. Arriving a
Gilman at 8.50 P. M.

8.30 P. M. NIGHT EXPRESS. DAILY. Arriving at Cairo 1.45 P. M., making direct connections for Arkansas and Texas.

This Route is from 100 to 175 MILES SHORTER and from 12 to 24 HOURS QUICKER than any other

PEORIA, BURLINGTON AND KEOKUK LINE.

8.40 A. M. EXPRESS. Sundays excepted. Arriving at Peoria 2.30 P. M.; Peoria 8.50 P. M. Through coach from Chicago to Peoria.

8.30 P. M. EXPRESS. Sundays excepted. Arriving at Peoria 3.10 A. M.; Burlington 7.45 A. M.
Keokuk 8.15 A. M.; Hannibal 11.30 A. M. Sleeping cars from Chicago to Peoria and Chicago to Hannibal.

CLINTON AND SPRINGFIELD LINE.

8.40 A. M. DAY EXPRESS. Sundays Excepted. Arriving at Gibson 1.57 P. M.; Farmer City 2.57 P. M.; Clinton 3.48 P. M.; Springfield at 6.05 P. M.

8.30 P. M. NIGHT EXPRESS. Sundays excepted. Arriving at Gibson 12.30 A. M.; Farmer City 1.55 A. M.; Clinton, 2.38 A. M.; Springfield, 4.35 A. M.

DUBUQUE AND SIOUX CITY LINE.

9.30 A. M. DAY EXPRESS. Sundays Excepted. Arriving at Dubuque 7.00 P. M.; Waterloo, 12.05 A. M.; Fort Dodge, 5.35 A. M.; Sioux City, 12.32 P. M.

9.30 P. M. NIGHT EXPRESS. Sundays Excepted. Arriving at Dubuque 6.55 A. M.; Waterloo 12.05 P. M.; Fort Dodge, 7.00 P. M.; Sioux City, 7.10 A. M.

This is the only Route to Dubuque and Sioux City without Change.

For Tickets, Sleeping Car Berths and information, apply at the Illinois Central Railroad Ticket Office 121 Randolph street, near Clark, and at the Central Depot, foot of Lake street.

W. P. JOHNSON, Gen. Pass. Agt.

J. F. TUCKER, Gen. Supt.

ILLINOIS CENTRAL FREIGHT DEPARTMENT.

Freight taken for St. Louis, and points West and Southwest. For Hannibal and all points on the M. & T. R. R. For all landings on the Mississippi, Red and White Rivers, via Cairo and regular packets. The ONLY RAIL LINE TO MEMPHIS AND NEW ORLEANS, with

CARS RUN THROUGH WITHOUT CHANGE,

via the N. O., St. L. & C. R. R. and, by its connection at Frost, Tenn., the Direct Route to all points reached by the Green Line of the South; to Mobile, and points on the M. & O. R., via Jackson, Tenn., to Dixon, Freeport, Warren, Galena, Dunleith, and all landings on the Upper Mississippi during season of navigation, and without change of cars to Dubuque, Waterloo, Fort Dodge and Sioux City, Iowa; Vermillion and Yankton, Dakota Territory; and via Missouri Packets to points on the Upper Missouri.

Bills Lading and Rates furnished upon application at 121 RANDOLPH street, or foot of South Water street.

HORACE TUCKER, General Freight Agent.

WISCONSIN CENTRAL RAILROAD.

GARDNER COLBY, Pres., Boston, Mass.

E. H. ABBOTT, Treas., Boston,

Built and operated by Phillips & Colby Construction Company. E. B. Phillips, Pres. and Gen. Manager Milwaukee; Charles L. Colby, Vice-Pres. and Land Commissioner, Milwaukee; E. Bacon, Superintendent, Milwaukee; Henry Pratt, Auditor and Gen. Ticket Agent, Milwaukee.

OFFICES: Milwaukee, Wis., and 28 State Street, Boston, Mass.

SHORT LINE TO GREEN BAY, the WISCONSIN and CHIPPEWA PINERIES, ASHLAND and BAYFIELD, LAKE SUPERIOR, VIA MENASHA and STEVENS POINT.

TWO DAILY TRAINS FROM MILWAUKEE FOR MENASHA AND GREEN BAY.

ONE TRAIN FOR STEVENS POINT, WAUPACA, AMHERST, GRAND RAPIDS, PLOVER, PLAIN FIELD, COLBY, MEDFORD, PHILLIPS, FIFIELD AND ASHLAND.

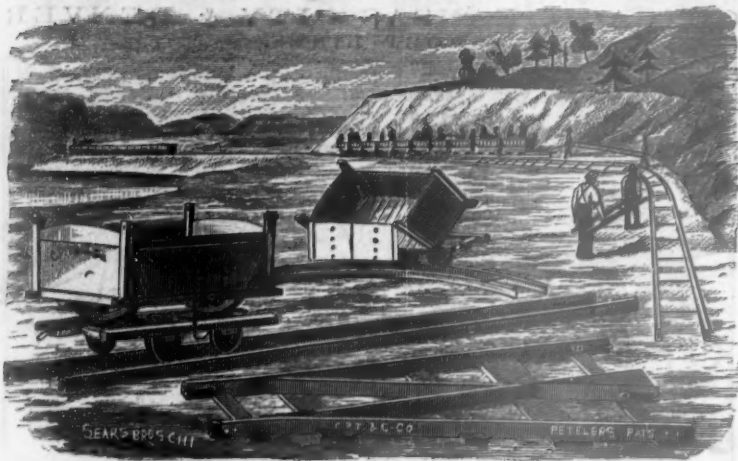
Through Sleeping Cars on 9:30 p. m. train from Chicago (C. M. & St. Paul Depot), and from Milwaukee on 1:30 a. m. train for Green Bay, Menasha and Stevens Point. Sleeping car at Milwaukee ready at 8:30 p. m.

ELEGANT NEW CARS HAVE BEEN ADDED.

Price of berth only \$1.50.

CONNECTIONS: At Milwaukee, with Chicago, Milwaukee & St. Paul, and Western Union Railways; at Plymouth, with Sheboygan & Fond du Lac Railroad, for Fond du Lac and Sheboygan; at Forest Junction, with Milwaukee, Lake Shore & Western Railway; at Green Bay, with Green Bay & Minnesota Railway, for New London, and Chicago & Northwestern Railway, for points North; at Dale, with fast stage line for New London; at Amherst Junction, with Green Bay & Minnesota Railway, for Grand Rapids and points West; at Junction City, with Wisconsin Valley Railway, for Wausau; at Portage with C. M. & St. Paul Ry., for Madison and the West.

PORTABLE RAILROAD TRACK AND CARS.



FOR USE IN RAILROAD CONSTRUCTION AND GENERAL GRADING, IN PLACE OF WAGONS.
OVER 60 PER CENT. SAVED IN COST OF HAULING.
AN OUTFIT PAYS FOR ITSELF IN 100 DAYS' WORK. Send for Circular.

CHICAGO PORTABLE TRACK AND CAR CO.,
Prop'rs Petroler's and other patents. 57 Dearborn Street, Chicago.

NATIONAL TUBE WORKS COMPANY,

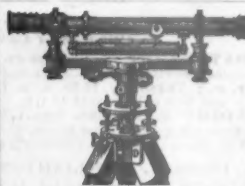
SOLE MANUFACTURERS OF
MACK'S PATENT INJECTORS,
WITH ALL LATEST IMPROVEMENTS
NOW BEING USED BY SEVERAL LEADING RAILROADS
ON THEIR FASTEST TRAINS,
Without the Use of the Pumps.

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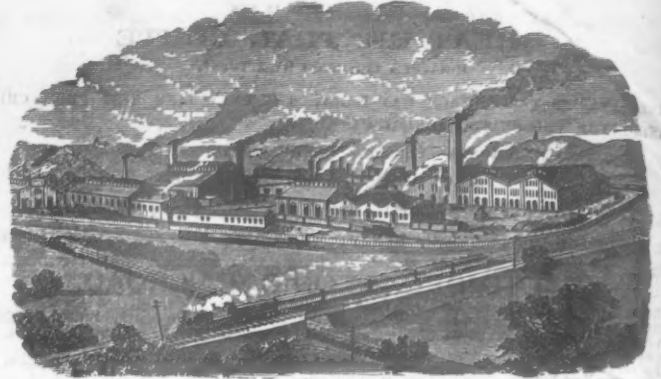
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